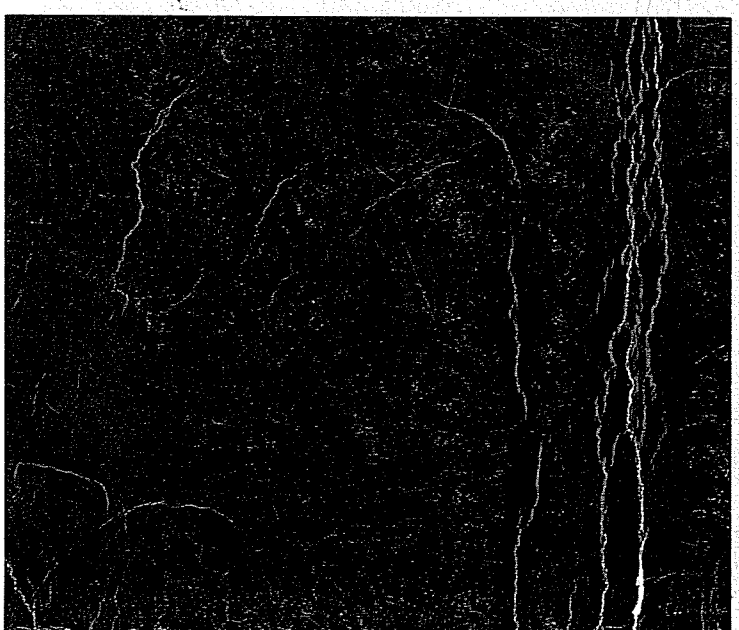
INTERNATIONAL®

INTERNATIONAL® CUB® and CUB LO-BOY® Tractors

OPERATOR'S MANUAL



To The Owner

We are glad to welcome you as an owner of a product of International Harvester Company. You have a fine product designed and built to give you many years of efficient operation. The way you operate and the care you give this product will have much to do with its successful performance.

To help you operate your equipment with utmost efficiency we have provided this operator's manual. It has been carefully prepared to give you the benefit of many years of experience gained in field testing and normal usage of this and similar products.

We urge you to study this manual so you will understand your new equipment thoroughly before operating it. We also urge you to take care of your manual so you will have it available for reference when you need it.

If your manual is lost or destroyed, a new copy may be ordered from the International Harvester dealer at a nominal price. Your International Harvester dealer will also be glad to answer any questions you may have on the operation or care of this product.

CONTENTS

Description	Page No.
Contents	Cover No. 2
Safety Instructions	1
Introduction	2, 3
Instruments and Controls	4 to 6
Before Operating the Tractor	7
Preparing for Each Day's Work	8
Gasoline Engine	9, 10
Gasoline Fuel System	10, 11
Driving the Tractor	11, 12
Touch Control System	13, 14
Fast Hitch	14 to 17
Hitching Trailing Equipment to the Tractor	18
Belt Pulley and Power Take-Off	19, 20
Cooling System	21 to 24
Air Cleaning System	24, 25
Electrical System	25 to 41
Minor Engine Service Operations	42, 43
Front Wheels	44, 45
Rear Wheels	46, 47
Weights	48, 49
Pneumatic Tires	50, 51
Brakes	51, 52
Clutch	52, 53
Storing the Tractor	53, 54
Cold Weather Precautions	55
Trouble Shooting	56 to 60
Lubrication	60 to 64
Lubrication Table	65
Lubrication Guide	66 to 71
Preventive Maintenance Guide	72, 73
Specifications	74, 75
Extra Equipment and Accessories	76
Index	76, 77

DELIVERY SERVICE FOR CUB AND CUB LO-BOY TRACTORS

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Delivered to _____ Dealer _____

R.R. No. _____ Box No. _____ Town _____

Town _____ Serial No. 244607

State _____ Zip _____ Engine Serial No. 251341 R-8

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, and safe operation. The warranty policy provisions were also explained and reviewed.

_____
DEALER'S SIGNATURE

Above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

_____ _____
DATE *OWNER'S SIGNATURE*

FOLD BACK HERE AND ADD CARBON

FOLD FORWARD HERE AND ADD CARBON

DELIVERY SERVICE FOR CUB AND CUB LO-BOY TRACTORS

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

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R.R. No. _____ Box No. _____ Town _____

Town _____ Serial No. _____

State _____ Zip _____ Engine Serial No. _____

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_____
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_____ _____
DATE *OWNER'S SIGNATURE*

DEALER'S COPY

OWNER'S COPY

CUT ALONG THIS LINE FIRST

DELIVERY SERVICE FOR CUB AND CUB LO-BOY TRACTORS

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Delivered to _____ Dealer _____

R.R. No. _____ Box No. _____ Town _____

Town _____ Serial No. _____

State _____ Zip _____ Engine Serial No. _____

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, and safe operation. The warranty policy provisions were also explained and reviewed.

_____
DEALER'S SIGNATURE

Above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

_____ _____
DATE *OWNER'S SIGNATURE*

REGIONAL OFFICE COPY

TECHNICAL PUBLICATIONS AVAILABLE

Your International Harvester Dealer and his factory trained servicemen are best qualified to service your equipment. Up-to-date instructions and adequate special tools are also a part of your Dealer's service facilities.

This Operator's Manual was prepared to instruct you in proper operation and maintenance of your equipment. If you desire additional information you may purchase Service Manuals and/or Parts Catalogs. Additional copies of the Operator's Manual are also available.

Fill out the order blank and forward together with your check or money order in the appropriate amount (U.S. Funds) to:

International Harvester Company

PRINTING AND
DISTRIBUTION SERVICES

807 Blackhawk Drive

Westmont, Illinois 60559

Attention: Cashier

Cut Along This Line

Cut Along This Line

Title	Number	Qty.	Price Each
Operator's Manual			
International Cub and Cub Lo-Boy Tractors	1 014 488 R8		4.40
Parts Catalogs			
International Cub and Cub Lo-Boy Tractors	TC-37F		5.50
Gasoline Engine (C-60)	ENG-1		10.30
Service Manual			
Chassis, Engine and Fuel System	GSS-1411		8.00

TOTAL _____

Please Print

Name _____

Street Address _____

City _____

State _____

Zip Code

_____ _____

Date **Signed**

Do not send cash or stamps

Prices subject to change without notice.

SAFETY INSTRUCTIONS



This symbol is used to call your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions.

Disengage all clutches and shift into neutral before starting the engine.

Disengage power to any attachments and stop engine before leaving operator's seat or making any repairs or adjustments.

Know the controls and how to stop quickly READ THE OPERATOR'S MANUAL.

Do not allow children or adults to operate the equipment without proper instructions.

Clear work area of objects which might be picked up by the mower and thrown.

Disengage power to any attachment when transporting or not in use.

Do not carry passengers. Keep children and pets a safe distance away.

Take precautions, such as disengaging power take-off, shifting into neutral, setting the parking brake, stopping the engine and removing ignition key when leaving machine unattended.

Reduce speed on slopes and in sharp turns to prevent tipping or loss of control.

Stay alert for holes in terrain and other hidden hazards.

Don't stop or start suddenly when going uphill or downhill.

Use care when pulling loads or using heavy equipment: A. Use only approved drawbar hitch points. B. Limit loads to those you can safely control. C. Don't turn too sharp, and use care when backing. D. Use counterweight or wheel weights when suggested in Operator's Manual.

Watch out for traffic when crossing or near roadways.

When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.

Handle gasoline with care - it is highly flammable: A. Use approved gasoline container. B. Never remove the fuel tank cap or fill the fuel tank when the engine is running, is hot, or fill the fuel tank indoors. Also, do not smoke when working around inflammable fuel. Wipe up spilled gasoline. C. Replace gasoline cap securely. D. Open doors if engine is in a garage - exhaust gasses are dangerous.

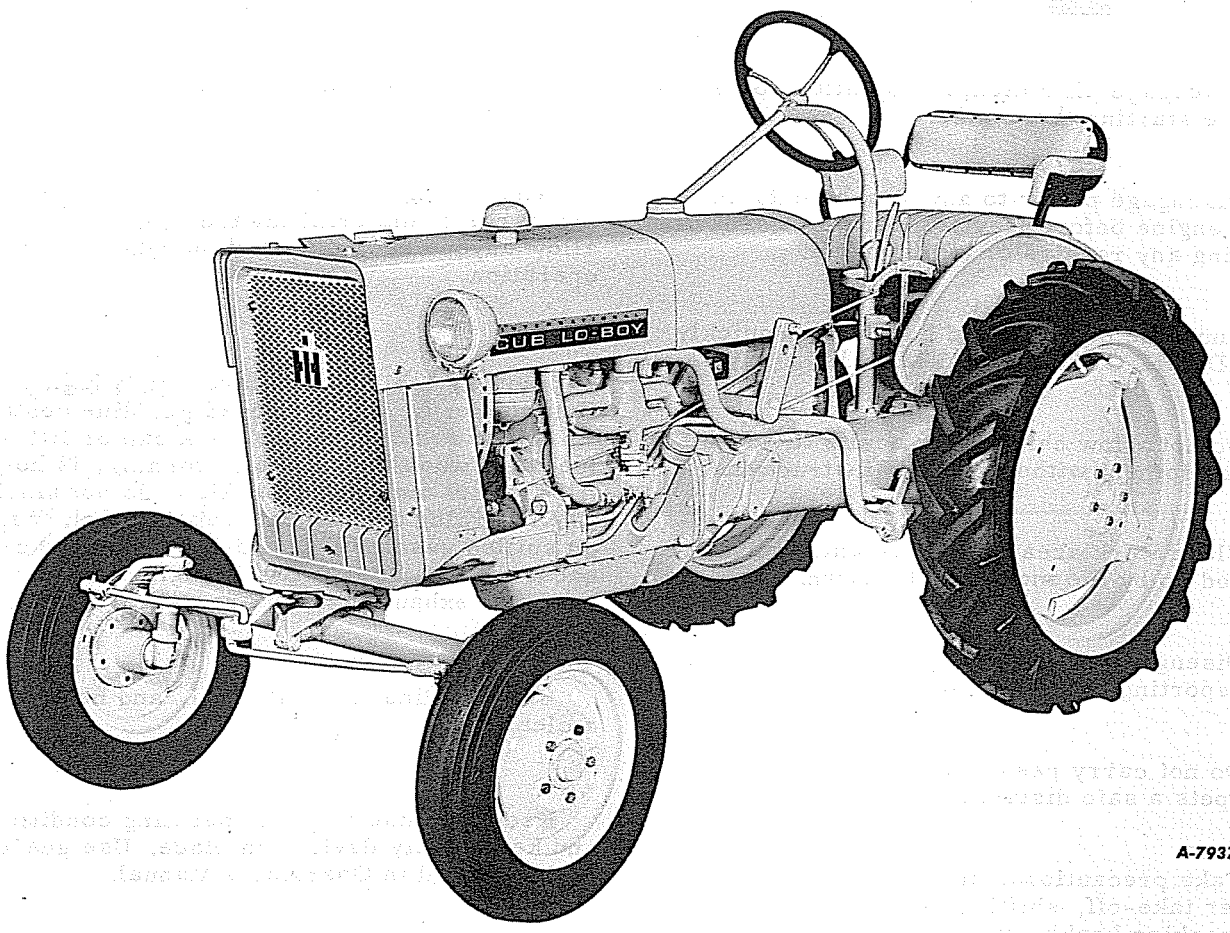
Use gasoline only as a fuel, and never as a cleaner.

Keep machine in good operating condition and keep safety devices in place. Use guards as instructed in Operator's Manual.

It is recommended that the machine be stopped and inspected for damage after striking a foreign object and that any damage be repaired before restarting and operating the machine.

Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. Relieve all pressure before disconnecting the lines or performing other work on the hydraulic system. To find a leak under pressure use a small piece of cardboard or wood. Never use hands.

INTRODUCTION



Illust. 2
International Cub Lo-Boy Tractor.

Assembled in this manual are operation, lubrication, and maintenance instructions for International Cub and Cub Lo-Boy Tractors. This material has been prepared in detail in the hope that it will help you to better understand the correct care and efficient operation of the tractor.

Your International Harvester dealer has factory-trained servicemen, modern tools, and IH service parts to assure you of satisfactory tractor operation. To get the most out of the tractor, and to assure economical operation and top performance, the tractor should be inspected periodically by your International Harvester dealer.

Depending upon your use of the tractor, these inspections should be performed as needed, or at least once a year, at which time a tune-up or other necessary service work should be performed. Proper pre-season maintenance will assure you of minimum lost time when your tractor is most needed.

Dealers are kept informed on the latest methods of servicing tractors. They carry stocks of IH parts, and are backed in every case by the full facilities of a nearby International Harvester district office and parts depot.

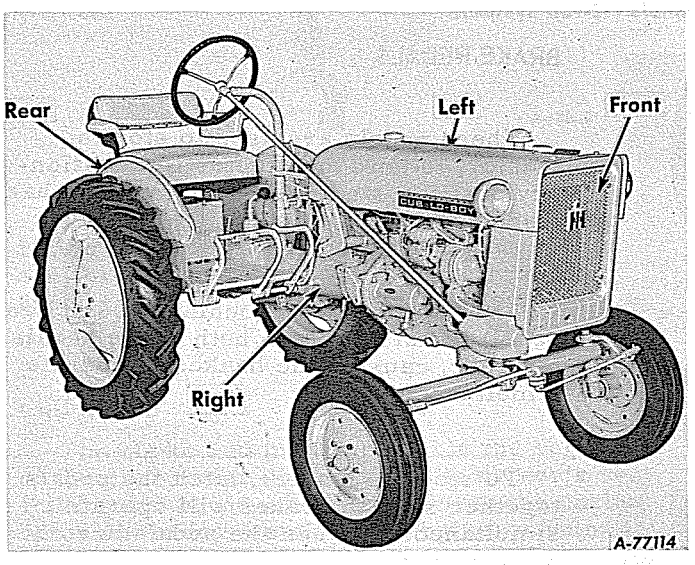
INTRODUCTION

In order to provide a tractor equipped as nearly as possible to suit each customer's needs, a variety of extra equipment and accessories is available. Refer to page 76.

Where operating and maintaining instruction on these items is required, it is included in the instructions for operating or maintaining the tractor. Disregard the instructions for equipment not on your tractor.

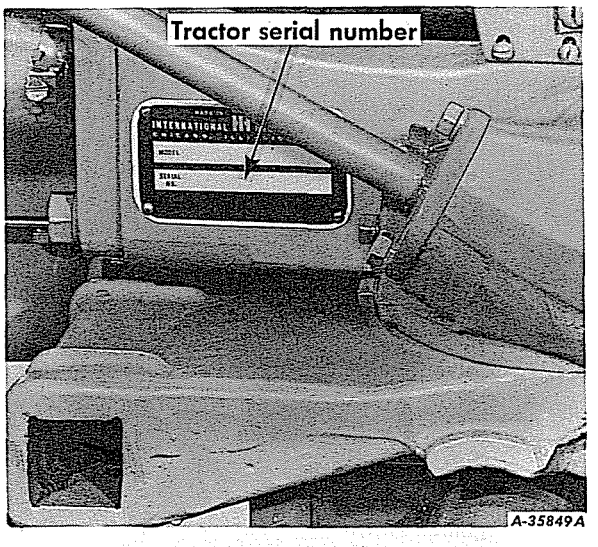
The illustrations in this manual are numbered to correspond with pages on which they appear; for example, **Illusts. 3, 3A and 3B, are on page 3.**

Throughout this manual the use of the terms LEFT, RIGHT, FRONT, and REAR must be understood to avoid confusion when following instructions. LEFT and RIGHT indicate the left and right sides of the tractor when facing forward in the driver's seat. Reference to FRONT indicates the radiator end of the tractor; to REAR; the hitch end. **See Illust. 3.**



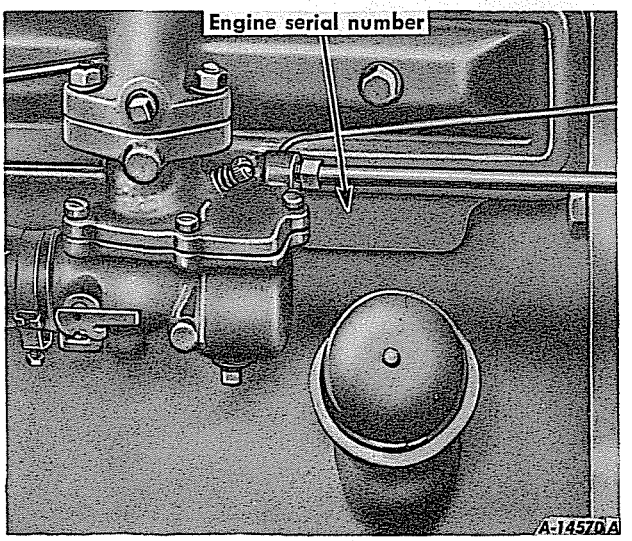
Illust. 3
Terms of location.

When in need of parts, always specify the tractor and engine serial numbers including prefix and suffix letters. The tractor serial number is stamped on a name plate attached to the right side of the steering gear housing. **See Illust. 3A.**



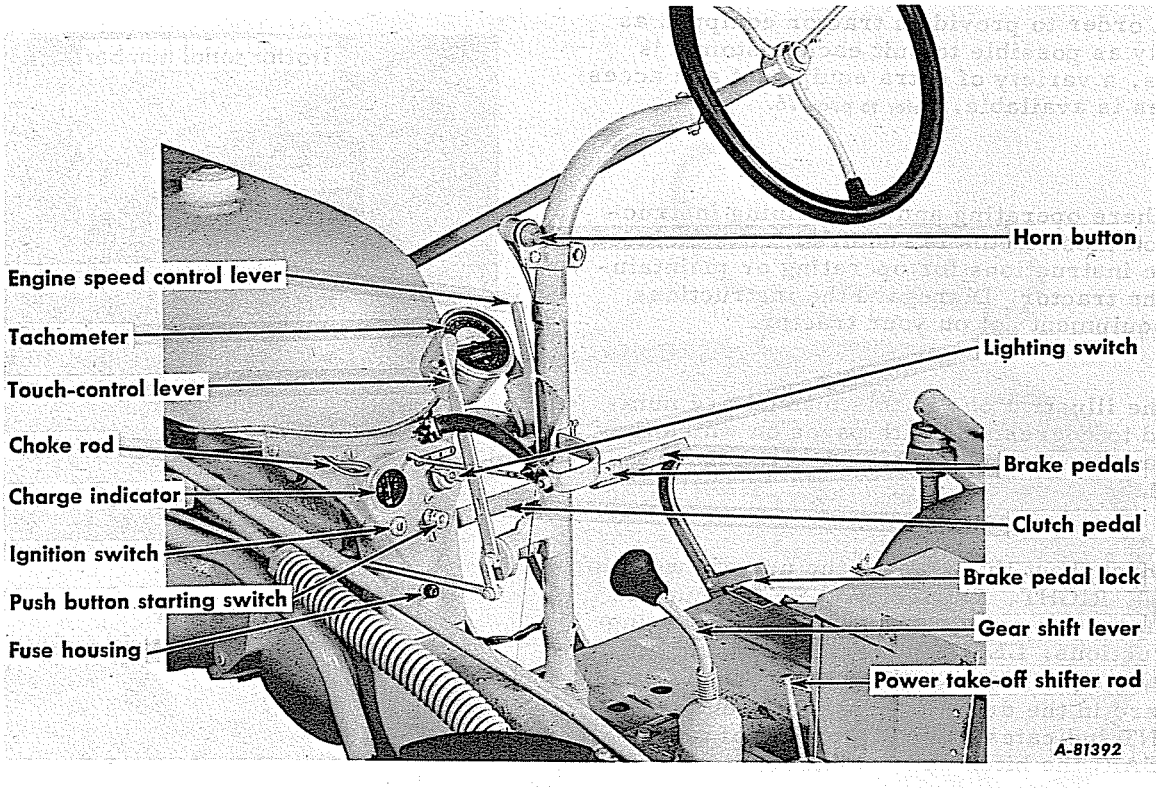
Illust. 3A
Location of the tractor serial number.

The engine serial number is stamped on the left side of the engine crankcase to the right of the carburetor. This serial number is preceded by the letters FCUBM. **See Illust. 3B.**

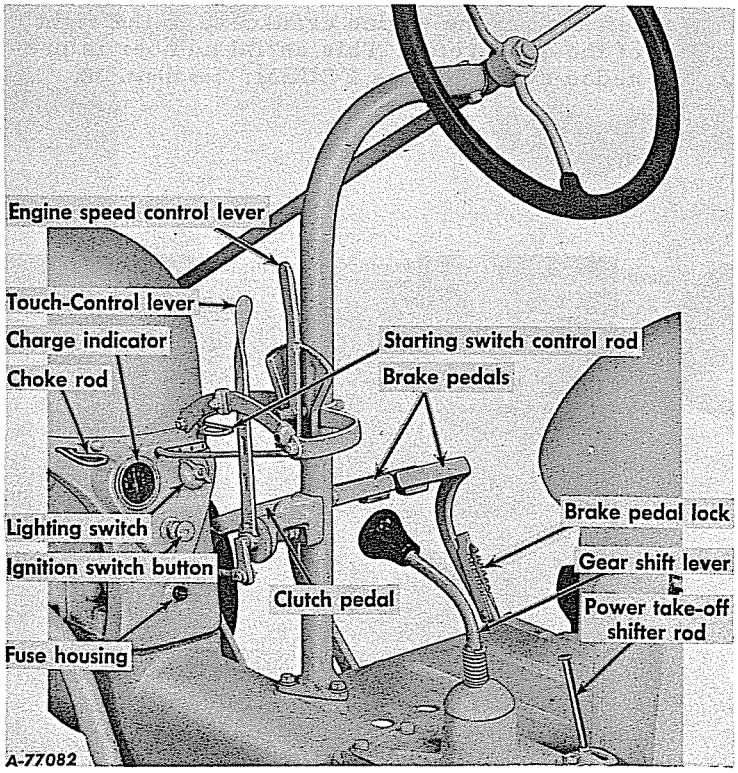


Illust. 3B
Location of engine serial number.

INSTRUMENTS AND CONTROLS



Illust. 4
Instruments and controls (12-volt system).



Illust. 4A
Instruments and controls (6-volt system).

BRAKE PEDALS

These pedals are used to stop the tractor, to hold the tractor in a stationary position, or to assist in making sharp turns.

The brake pedal latch (behind the left brake pedal) is used to latch both brake pedals together, causing the brakes to operate simultaneously.

To stop the tractor, latch the pedals together so both brakes will operate simultaneously when the pedals are pressed down.

To hold the tractor in a stationary position, latch the pedals together, depress and lock them in this depressed position by using the brake pedal lock.

To assist in making a sharp turn, the pedals must be operated individually, depressing the pedal on the side toward which the turn is to be made.

BRAKE PEDALS - Continued

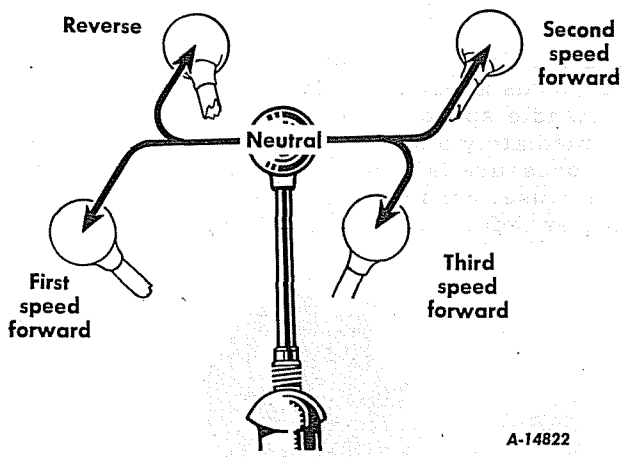
Caution! Always latch the brake pedals together when driving the tractor in high gear. To latch the pedals together, engage the latch (located in back of the left pedal) in the slot in back of the right pedal. When the brake pedals are not latched together, the latch should rest in the slot in back of the left brake pedal.

The brake pedal lock (Illust. 12A) is used to lock the brake pedals in the depressed position. This prevents the tractor from moving.

CLUTCH PEDAL

This pedal, when depressed all the way, disengages the engine from the transmission.

GEARSHIFT LEVER



Illust. 5 - Gear shifting positions.

This lever is used to select various gear ratios provided in the transmission. There are three forward speeds and one reverse speed. **See Illust. 5.** Refer to "Specifications" **on page 74.**

CHOKE ROD

The choke rod makes possible the regulation of the carburetor choke from the driver's seat. Pulling out on the choke rod closes the carburetor choke for starting the engine; pushing it back in opens the choke.

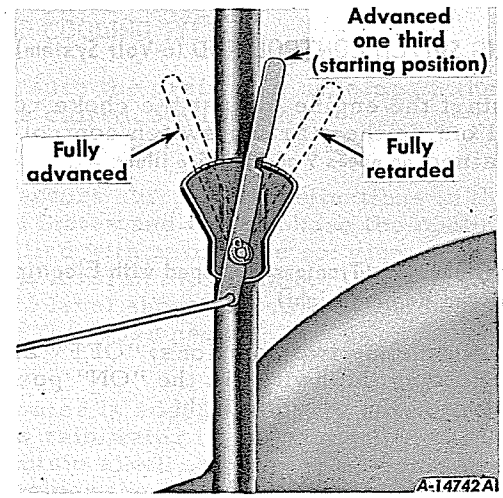
CARBURETOR CHOKE LEVER

The carburetor choke lever controls the air supply to the carburetor. When the choke lever **(Illusts. 9 and 9A)** is moved up all the way (closed position) the air supply is cut off, thereby enriching the fuel mixture for starting the engine. If your tractor is not equipped with a cranking motor and choke rod, move the choke lever up all the way before cranking the engine. Moving the choke lever back down opens the choke for normal engine operation.

ENGINE SPEED CONTROL LEVER

This lever controls the speed of the engine and, when set in a given position, will maintain a uniform engine speed even though the engine load may vary.

Do not permit the engine to run below the minimum idle speed for any length of time, or operate the engine at more than the regular governed speed. Excessive speed is harmful. Refer to the "Specifications" **on page 74.**



Illust. 5A
Various positions of the engine speed control lever.

GOVERNOR

The governor is set at the factory and should require no adjustment. Consult your International Harvester dealer if the governor does not function properly.

IGNITION SWITCH (12-Volt System)

A key-type ignition switch **(Illust. 4)** is located on the instrument panel. Turn the key clockwise to a horizontal position to turn on the ignition. The key cannot be removed when in this position.

Note: When the engine is not operating, or the engine has stalled and the operator leaves the tractor, the key must be turned to the "OFF" position to prevent battery discharge.

PUSH BUTTON STARTING SWITCH (12-Volt System)

Pushing the button in completes the electrical circuit between the battery and the cranking motor and causes the cranking motor pinion to engage the flywheel ring gear, thereby cranking the engine. **See Illust. 4.**

IGNITION SWITCH BUTTON (6-Volt System)

This button (Illust. 4A) closes and opens the electrical circuit for operating and stopping the engine. Pull the button out for operating and push it in to stop the engine.

Note: On tractors with battery ignition, when the engine is not operating or the engine has stalled and the operator leaves the tractor, the ignition switch button must be pushed all the way in, so that the switch is in the "OFF" position, to prevent battery discharge.

STARTING SWITCH CONTROL ROD (6-Volt System)

To start the engine, adjust the choke rod and pull out on the starting switch control rod as explained on pages 9 and 10. See Illust. 4A.

LIGHTING SWITCH (Tractors Equipped with Electric Starting and Warning Light)

The switch has two positions; "OFF" and "ON". Placing the switch in the "ON" position activates the warning light.

LIGHTING SWITCH (Tractors Equipped with Electric Starting and Lighting)

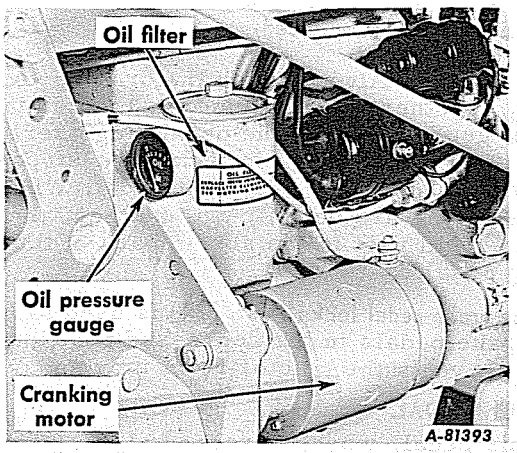
The switch has four positions: "OFF" position; "D" position for dim headlights, bright instrument lights, a red taillight, and a warning light; "B" position for bright headlights, instrument lights, a red taillight, and a warning light; and "R" position for bright headlights, instrument lights, and a white rear light. The red taillight should always be used when traveling on the highway at night or during times of poor visibility. The white rear light is for field use only and should not be used on the highway.

BELT PULLEY AND POWER TAKE-OFF SHIFTER ROD

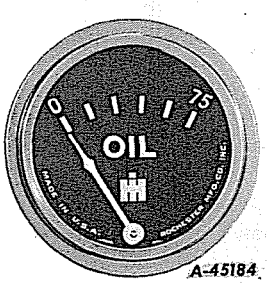
The shifter rod is used to engage or disengage the belt pulley or the power take-off. Refer to pages 19 and 20 for operating instructions.

OIL PRESSURE GAUGE

This gauge (Illusts. 6 and 6A) indicates whether lubricating oil is circulating through the engine. The indicator needle should move at least one-third of the distance between "0" and the first mark when the engine is running at speeds approximately 100 r.p.m. above slow idle speed. If it does not, stop the engine immediately and investigate the cause of the oil pressure failure. If you are unable to find the cause, consult your International Harvester dealer before operating the engine.



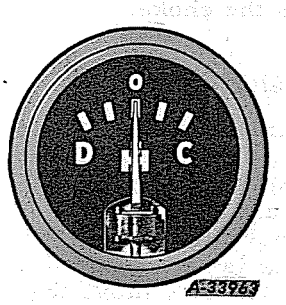
Illust. 6
Location of oil pressure gauge.



Illust. 6A
Oil pressure gauge.

CHARGE INDICATOR

This instrument indicates whether the generator is charging or the battery is discharging. If it shows discharge continuously, investigate the cause to avoid completely discharging the battery and possible damage to the generator. Refer to pages 33 and 34 for additional information.



Illust. 6B
Charge indicator.

BEFORE OPERATING THE TRACTOR

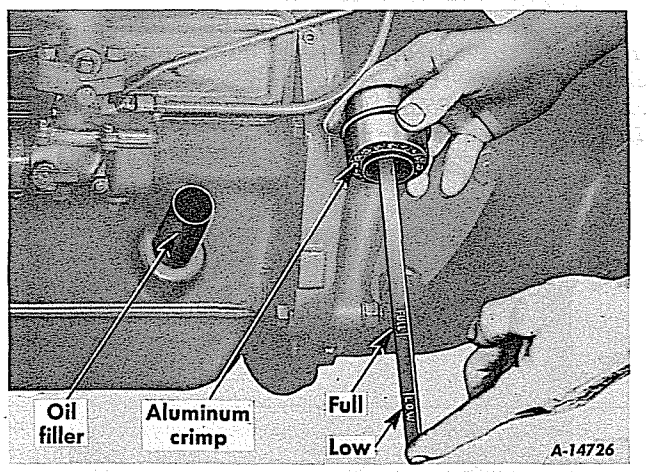
TRACTOR BREAK-IN PROCEDURE

Never operate an engine immediately under full load. Break it in carefully, no load, light load, and medium engine load for the first 25 hours.

Period	Engine Speed Control Lever Position	Load
1st hour	Fully advanced	Maintain engine speed 100 RPM above full load governed speed.
2nd Thru 5th hours	Fully advanced	Full load governed speed with occasional short periods of lighter load.

Note: Do not use heavy tillage implements such as plows or disk harrows during this period.

LUBRICATION



Illust. 7
Crankcase breather and oil level gauge.

Lubricate the entire tractor, using the "Lubrication Guide."

Check the oil levels of the engine crankcase air cleaner, transmission, belt pulley housing and all gear cases to see that they are filled to the correct levels with oil of the proper viscosity for the prevailing temperature. Refer to "Lubrication Guide" on pages 66 to 71.

Tractors packed for export have all oil drained from the engine crankcase, air cleaner and all gear cases.

PNEUMATIC TIRES

Before moving the tractor, check the air pressure in the pneumatic tires and inflate or deflate the front tires to twenty pounds and the rear tires to twelve pounds. Refer to the tables on pages 50 and 51 for more complete information.

ENGINE COOLING SYSTEM

Be sure the drain plug underneath the radiator is closed. See Illust. 22.

Tractors shipped to destinations in the United States and Canada have the cooling system filled with antifreeze solution. Check the coolant level in the radiator. When cold, the coolant level should be slightly below the bottom of the filler neck.

If water is added, use only clean water; soft or rain water is recommended, as it does not contain alkali, which forms scale and eventually clogs the passages.

Never start or operate the engine without water or antifreeze solution in the cooling system.

For further information, see "Cooling System" on pages 21 to 24. If the tractor is to be operated in freezing temperatures. refer to "Cold Weather Precautions" on page 55.

FUEL SYSTEM

International Harvester gasoline burning engines are specifically designed for use with regular grade gasoline having a 90 minimum octane rating — Research Method (approximately 84 Motor Method).

Use clean fuel and keep it clean. Store fuel in tanks equipped with hose and nozzle to prevent contamination of the fuel. The use of funnels, cans, and drums is not recommended because they are difficult to keep clean.

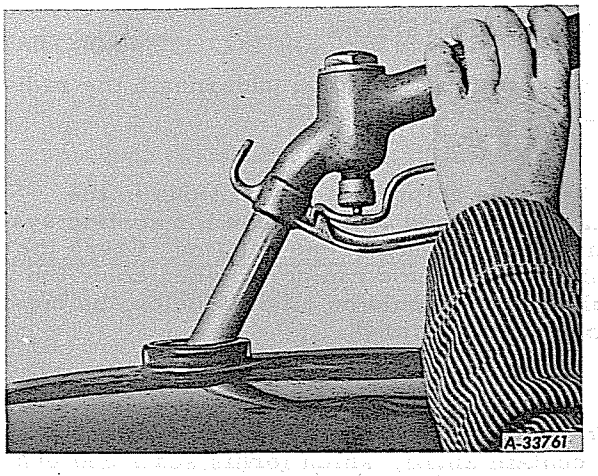
INSTRUMENTS AND CONTROLS

Thoroughly acquaint yourself with all instruments and controls as described on pages 4 to 6.

PREPARING FOR EACH DAY'S WORK

Air cleaner cap ..... Remove any dirt or chaff.
Air cleaner oil cup ..... Remove, clean and refill. See the "Lubrication Guide."
Lubrication points ..... See "Lubrication Guide."
Cooling system ..... Check the level of the coolant in the radiator.

FILLING THE FUEL TANK

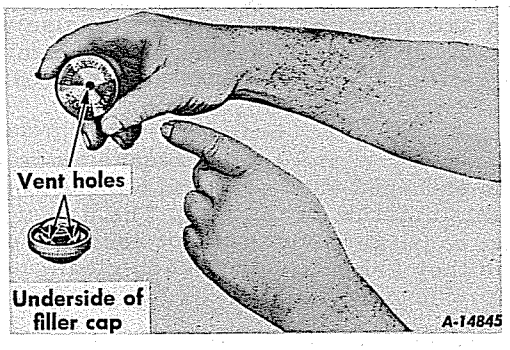


Illust. 8
Filling the fuel tank.

Fill the fuel tank, preferably at the end of each day's work. This will force out any moisture-laden air and prevent condensation.

Note: Do not fill the tank to its full capacity as space is required for vapor expansion in the event of a temperature change. A tank filled to capacity may overflow if exposed to a rise in temperature or direct sunlight.

Caution! Never remove the fuel tank cap or fill the fuel tank when the engine is running, is hot, or near an open flame.



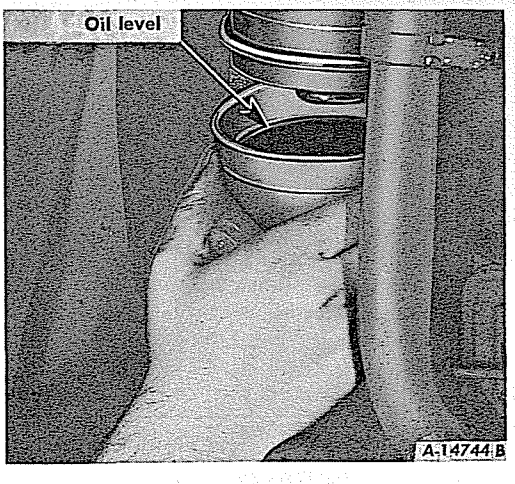
Illust. 8A
Vent holes in filler cap.

Do not smoke or use an oil lantern when working around inflammable fuels. When pouring fuel, keep the hose and nozzle or the funnel and container in contact with the metal of the fuel tank to avoid the possibility of an electric spark igniting the fuel. Do not light matches near inflammable fuels, as the air within a radius of several feet is mixed with a highly explosive vapor.

The fuel tank filler cap has air vents. **See Illust. 8A.** Keep these vents open at all times to assure proper flow of the fuel.

AIR CLEANER OIL CUP

The air cleaner cap should be cleaned, and the oil in the air cleaner oil cup should be changed more frequently than every ten hours of operation, if unusually dusty and dirty conditions are encountered.



Illust. 8B
Oil level bead in air cleaner oil cup.

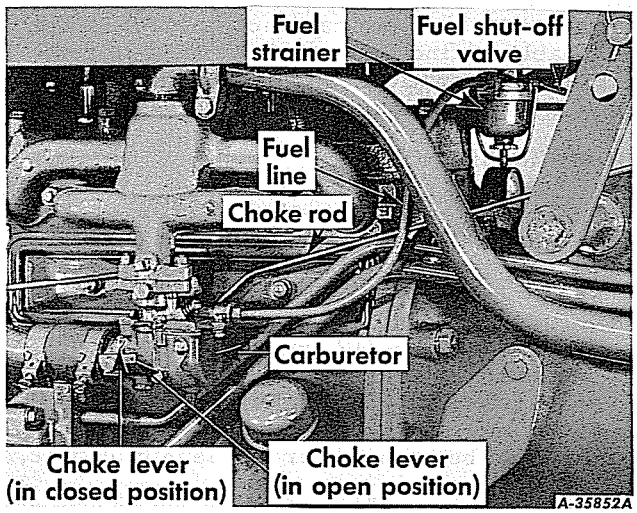
GASOLINE ENGINE

Before attempting to start or operate the tractor, be sure you review the instructions for the new tractor and thoroughly familiarize yourself with the instruments and controls.

This engine is designed to operate on gasoline with a 90 minimum octane rating (Research Method).

The use of unleaded gasoline will lengthen spark plug and valve life, maintain engine performance longer, and reduce rust and corrosion of engine while stored.

FUEL SYSTEM



Illust. 9
Fuel system and controls.

Be sure the shut-off valve on the fuel strainer under the gasoline tank is open. To prevent leakage or seepage when the valve is in its full-open position, screw out the needle stem (shut-off valve) until the seat on the stem is tight against the stop.

STARTING THE ENGINE (12-Volt System)

1. Put the gearshift lever in the neutral position. **See Illust. 5.**

2. Pull the choke control button all the way out.

When using the choke, avoid overchoking, as excessive use of the choke will flood the engine, making it hard to start. The use of the choke for starting will vary, depending on temperature and altitude.

3. Advance the engine speed control lever one-third. **See Illust. 5A.**

4. Disengage the engine clutch.

5. Turn the ignition key clockwise to a horizontal position. Press the push button starting switch and release it as soon as the engine starts; however, do not operate the cranking motor for more than 30 seconds at any one time. If the engine does not start within this time, release the push button starting switch and wait a minute or two; then try again.

Note: Never operate the cranking motor while the engine is operating.

6. Slowly release the clutch after the engine starts.

STARTING THE ENGINE (6-Volt System)

1. Put the gearshift lever in the neutral position. **See Illust. 5.**

2. Pull the choke rod all the way out. **See Illust. 4A.**

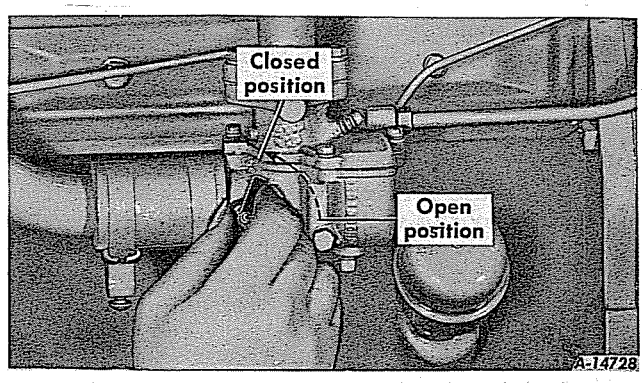
Avoid overchoking, as excessive use of the choke will flood the engine, making it hard to start. The use of the choke for starting will vary, depending on temperature and altitude.

3. Advance the engine speed control lever one third. **See Illust. 5A.**

4. Pull out on the ignition switch button. **See Illust. 4A.**

5. Disengage the engine clutch by pressing down on the clutch pedal. **See Illust. 4A.**

6. Pull out on the starting switch control rod **(Illust. 4A)** and release it as soon as the engine starts. However, do not operate the cranking motor for more than 30 seconds at any one time. If the engine does not start within this time, release the starting switch control rod and wait a minute or two; then try again.



Illust. 9A
Closing the carburetor choke lever.
(Tractors without cranking motor).

STARTING THE ENGINE - Continued

Note: Never operate the cranking motor while the engine is rotating.

7. Slowly release the clutch after the engine starts.

Caution! When hand cranking the engine, be sure that the gearshift lever is in the neutral position. Always stand in a position that will eliminate any possibility of being struck by the starting crank, if there is a reversal of the direction of the engine. Crank the engine by using quick up-strokes; do not spin it.

AFTER THE ENGINE STARTS

As soon as the engine starts, adjust the choke to a point where the engine operates without missing, and as the engine warms up, open the choke by gradually pushing the choke rod all the way in, or by moving the carburetor choke lever down all the way. **See Illusts. 9 and 9A.** Do not use the choke to enrich the fuel mixture, except when starting the engine.

Immediately after the engine starts, check the oil pressure gauge **(Illust. 6A)** to see whether lubricating oil is circulating through the engine. If it is not, stop the engine and inspect the oil system to find the cause of failure. If you are unable to find the cause, be sure to consult your International Harvester dealer before operating the engine.

STOPPING THE ENGINE

Retard the engine speed control lever by pulling it all the way back **(Illust. 4A).** Allow the engine to cool slowly from full-load operation by slowly idling the engine for a short time. Then turn the ignition key counter-clockwise to the "OFF" position (12-volt system) or push the ignition switch control button all the way in (6-volt system) to stop the engine. It is advisable to close the gasoline shut-off valve if the engine is to be stopped for any length of time.

GASOLINE FUEL SYSTEM

Note: Unusual operating conditions, or fuel octanes below those recommended, may require modification of the specified ignition timing (shown in "Specifications") to a retarded position. Retard from the specified setting as required, approximately one degree for each octane below 90, to eliminate knock (not more than 6 degrees). It is recommended that this be done by an International Harvester dealer.

CLEANING THE FUEL STRAINER AND SEDIMENT BOWL

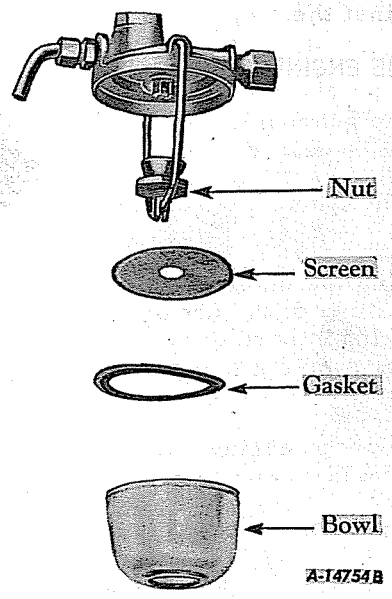
Clean the fuel strainer after every 250 hours of operation. To do this, proceed as follows:

1. Close all shut-off valves.

2. Take the strainer apart by loosening the nut under the sediment bowl.

3. Clean the sediment bowl and clean the screen if necessary.

4. When reassembling, be sure the cork gasket between the bowl and the main body is in good condition and does not leak. Use a new gasket if necessary.



Illust. 10
Fuel strainer showing the glass bowl removed for cleaning.

GASOLINE FUEL SYSTEM

CARBURETOR

Use clean fuel; the presence of dirt and water will disturb the functioning of the carburetor. Clean the fuel screen after every 500 hours of operation.

The fuel screen can be removed for cleaning by unscrewing the fuel line fitting and removing the elbow; clean the screen and replace it.

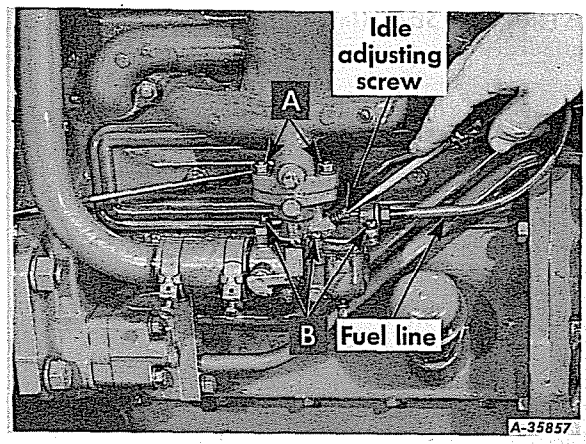
The flange nuts which hold the carburetor to the manifold should be checked periodically for tightness. **See "A", Illust. 11.**

Occasionally check cover screws which fasten the fuel bowl to the fuel bowl cover. **See "B" Illust. 11.** They should be kept tight to avoid any air leakage past the fuel bowl cover gasket.

The engine and carburetor are correctly set when shipped from the factory. If this setting has been disturbed for any reason, proceed as follows:

Adjusting the Idle Adjusting Screw

Close the idle adjusting screw to its seat by turning it to the right (or in); then open it one turn. Start the engine and operate it at fast idling speed (without any load) until thoroughly warm. Cover the radiator if necessary or close the radiator shutter if the tractor is so equipped.

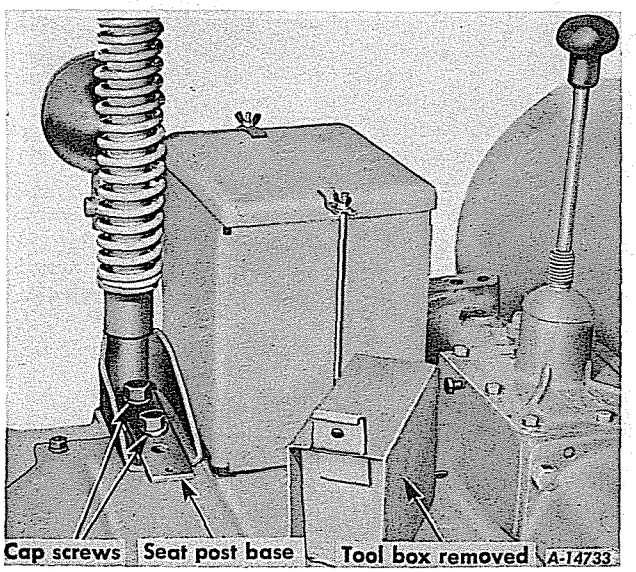


Illust. 11
Carburetor adjustment.

While the engine is running at fast idle speed, it is advisable to screw in the throttle stop screw a few turns to prevent the engine from stopping when the throttle is closed. Now close the throttle. The engine will then be idling at a fairly high speed and the throttle stop screw can be backed out a little at a time until the desired idle speed is obtained.

If the engine misses or rolls while backing out the throttle stop screw, the idle adjusting screw may be adjusted either in or out until the engine operates smoothly. Speed up the engine for a few seconds; then recheck the idle adjustment. A slight adjustment in or out will give the smoothest idle.

DRIVING THE TRACTOR



Illust. 11A
Seat post base in the forward position (International Cub).

Caution! Only one person, the operator, should be permitted to ride on the tractor when it is in operation.

ADJUSTING THE SEAT (International Cub)

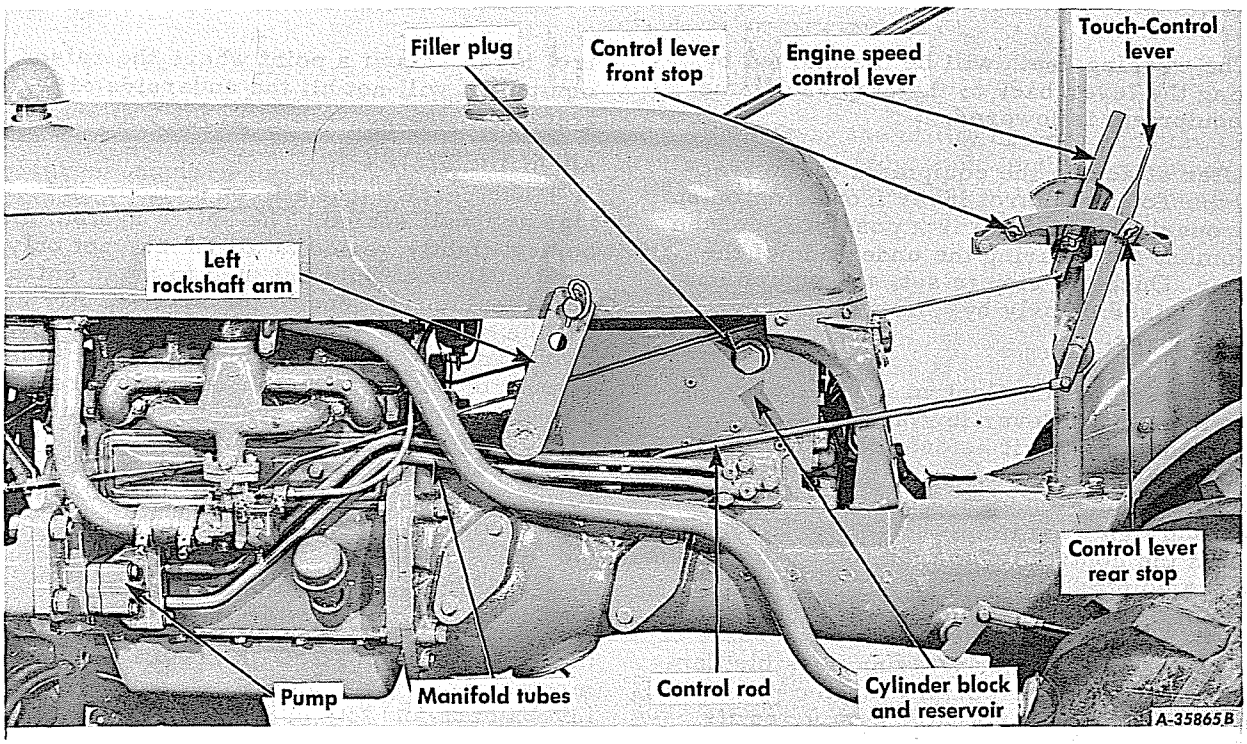
The tractor seat can be set in either of two positions by removing the tool box and changing the position of the two cap screws in the seat post base **(Illust. 11A)**, giving a total adjustment of 1-1/2 inches. Tighten the cap screws securely when reassembling and replace the tool box.

ADJUSTING THE SEAT (International Cub Lo-Boy)

Before starting the tractor, adjust the seat to the most comfortable position of the four positions available to the operator.

The seat is quickly and easily adjusted by changing the position of the four cap screws in the seat support bracket **(Illust. 12)** giving a total adjustment of 4-3/8-inches. Tighten the cap screws securely when reassembling.

TOUCH-CONTROL SYSTEM



Illust. 13
Touch-Control system.

The Touch-Control system is ready to operate whenever the engine is running. You will receive the maximum of satisfactory service by closely adhering to the following simple precautions and service operations.

The importance of keeping the system free from all dirt, grit, and other foreign matter cannot be stressed too strongly. Keep the Touch-Control fluid reservoir, pipe lines, and pump as clean as possible at all times. The same care must be given to the cylinder, hose lines, and connections. As an added precaution against the entry of dirt into the system, the reservoir is constructed without an air vent. Sufficient air space is allowed above the fluid level to compensate for the pressure changes occuring during the operation of the system. As a result a small amount of pressure may be found in the reservoir upon removing the filler plug when checking the fluid level.

Note: Always keep the Touch-Control lever or levers in the rearward position (toward tractor seat) when the tractor or the Touch-Control system is not being actively used. This places the piston in the retracted position, preventing exposure to any moisture which may have condensed in the leather dust boot.

The control lever **(Illust. 13)** gives the operator complete, instantaneous and effortless control of all the direct-connected equipment operating adjustments. The use of the lever will depend on the type of equipment mounted on or pulled by the tractor. Complete instructions for operating the lever are included in the Owner's or Operator's Manual furnished with the equipment. General instructions for operating the lever are given below.

The control lever quadrant is provided with a pair of adjustable Touch-Control lever stops.

The front stop when set in a given position will limit the travel of the control lever and prevent the equipment from being raised above the desired height.

The rear stop is used to point out the position where the control lever should be each time the equipment is lowered to maintain a uniform working depth.

To lower the equipment, move the control lever back until the equipment has reached the desired working depth; then move the rear stop to this position and tighten in place.

TOUCH-CONTROL SYSTEM

The working depth will be maintained by moving the lever back to the stop each time the equipment is lowered.

After attaching the equipment to the tractor, the Touch-Control lever front stop must be properly set if there is a possibility of the equipment not clearing the underside of the tractor. Once the stop is set, the equipment can be raised quickly by a flick forward on the control lever.

To set the Touch-Control stop, slowly move the control lever forward to raise the equipment and stop it before the equipment hits any part of the underside of the tractor. Then move the stop up against the control lever and tighten it in this position. This will prevent the control lever from being moved past the point of the desired lifting height.

Note: If the equipment hits the underside of the tractor, in addition to doing possible damage to the tractor or equipment, the Touch-Control system will not have completed its cycle and this will cause the pump unit to operate at maximum high pressure and heat the IH Hy-Tran® fluid excessively, thereby causing possible internal damage to the pump. This condition can be quickly detected by a noticeable loading of the engine.

If this condition should occur, immediately move the control lever back and set the control lever stop at a point where the raised equipment will not hit the underside of the tractor.

AIR IN THE SYSTEM

Make certain that all connections and openings are well sealed. The entire system must be kept tightly sealed at all times, not only to prevent loss of fluid but also to avoid entrance of air in the inlet end of the system. Air entering the system interferes with proper lubrication of moving parts. It causes an increased amount of vibration and an unsteady pressure. Presence of air in the system will be noticed by a noise in the pump or by the pump laboring when operating under high pressure. Proper filling of the reservoir and working the system during the filling process, will work the air out of the system.

Freeing the System of Trapped Air

Start the tractor engine and operate it at a moderate idle speed. With the filler plug removed, move the Touch-Control lever or levers back and forth 10 to 12 times through its full range of travel. This quickly frees the system of trapped air. Then with the control lever in the rearward position (toward tractor seat), stop the engine.

If necessary, add sufficient clean fluid to the reservoir to bring the fluid level to within 1/2-inch of the bottom of the filler opening. Replace and tighten the filler plug.

FAST-HITCH

Touch-Control raises and lowers the complete hitch, thus raising the equipment to the transport position, or lowering it to the working position.

The leveling crank at the rear of the tractor controls leveling, and the depth adjusting crank on the right side controls depth adjustment.

When operating the hitch in other than the fixed drawbar position, the belt pulley must be removed. The belt pulley shaft must be covered with the belt pulley shaft guard and the power take-off shaft must be covered with the power take-off shaft guard, if not already so protected.

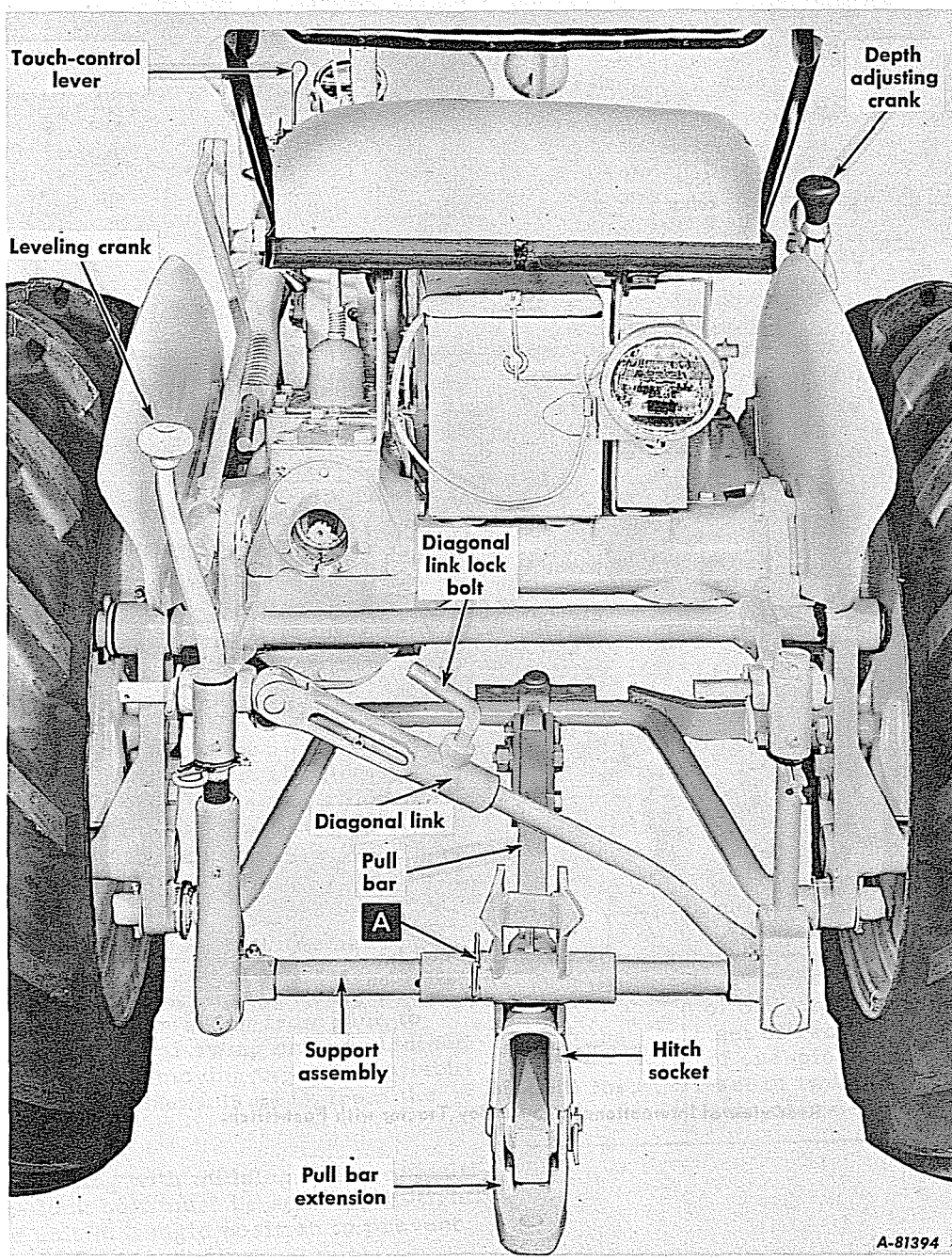
Note: Refer to page 13 for additional information regarding the Touch-Control system.

Note: The following operating and adjusting instructions are general only. **Refer to the implement Operator's Manual for specific instructions.**

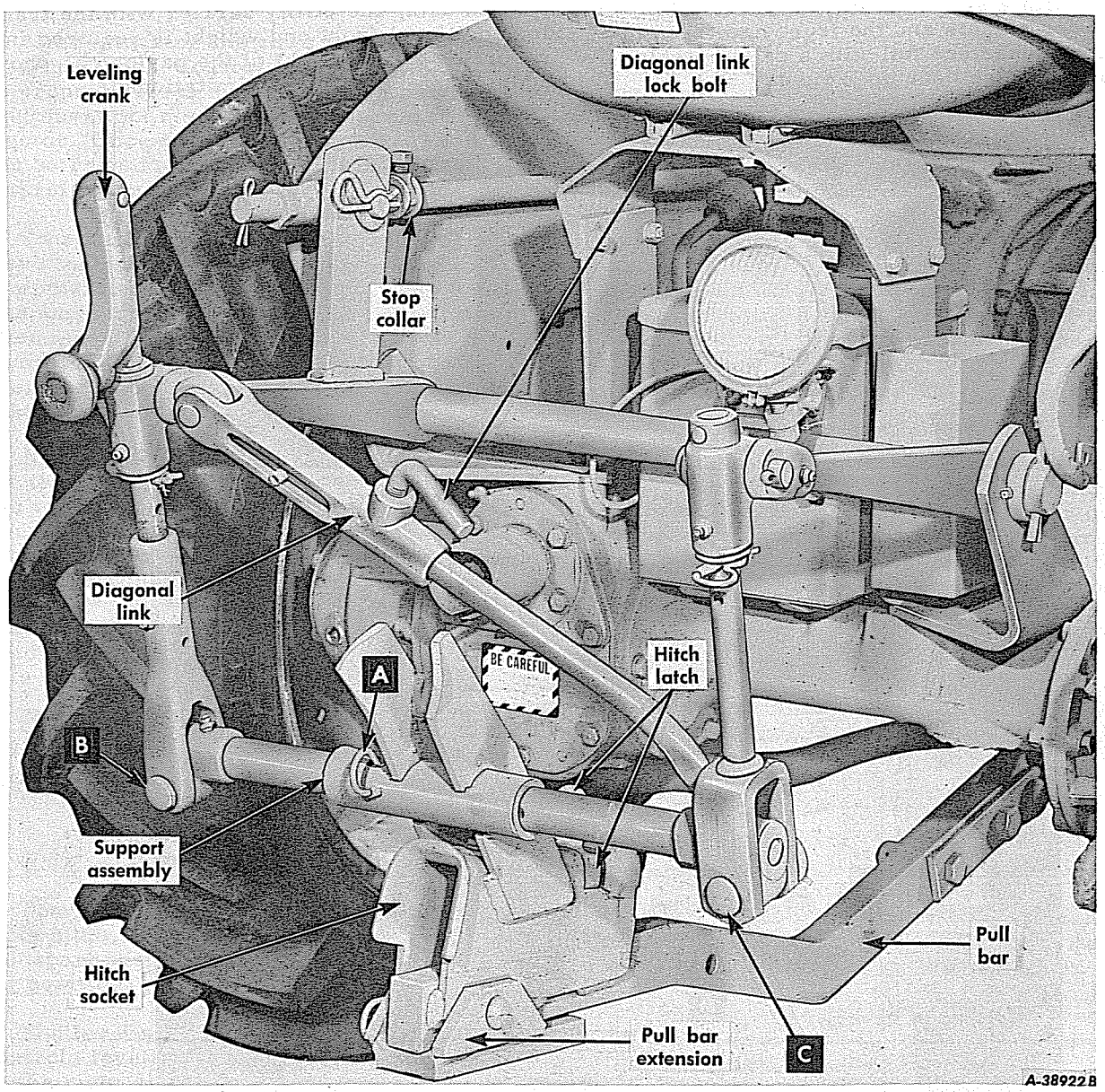
The Touch-Control hand lever serves to control the raising and lowering of equipment. Do not attempt to gauge the depth with this lever unless so instructed in the equipment manual. Plows must be free to float up and down and to seek their own level as determined by the hitch setting. The depth adjusting crank **(Illusts. 15 and 16)** serves to control the working depth of plows and various other equipment. The leveling crank controls leveling as required for plowing when opening up a furrow or for a change in plowing depth. The diagonal link permits the plow to swing from side to side, when the lock bolt is loose so the diagonal link is free to swing.

Note: Before operating tractors equipped with Fast-Hitch, the front wheels must be equipped with a set of either one-piece or two-piece wheel weights and the front tire tubes filled three-quarters full with a calcium chloride solution. See "Liquid Weights" and "Front Wheel Weights".

When using the utility carrier with the tractor, additional front end weight is required in proportion to the weight of the payload as shown under "Fast-Hitch Load Limitations".



Illust. 15
Rear view of International Cub Tractor with Fast-Hitch.



Illust. 16
Rear view of International Cub Lo-Boy Tractor with Fast-Hitch.

COUPLING THE EQUIPMENT

Adjust the height of the hitch socket with the Touch-Control and level the hitch with the leveling crank so the prong of the equipment can enter the hitch socket when the tractor is backed against the equipment (Illusts. 15 and 16). The latch snaps shut when the prong reaches the proper position.

To uncouple the equipment on ground level, lower the equipment to the ground, reach back and lift the hitch latch (Illusts. 15 and 16) with the forefinger. If the latch is difficult to disengage, back the tractor slightly against the equipment to relieve the strain on the latch. The latch will remain open until the equipment prong is withdrawn.

HITCH ADJUSTMENTS

The height of the hitch determines the working depth of the equipment. The depth adjusting crank (Illusts. 15 and 16) raises and lowers the front end of the pull bar to reach the desired working depth called for in the instructions in your equipment manual.

PULL BAR EXTENSION

A pull bar extension is available for pulling trailing-type equipment. When in use, the extension is attached to the pull bar with the hitch hole toward the rear. It is held in place by a pivot pin and a quick attachable cotter pin. When not in use, the pull bar extension should be turned with the hitch hole toward the front. See Illusts. 15 and 16.

When plowing, the lock bolt (or hand screw) on the diagonal link must be loose or unscrewed far enough so that the diagonal link is free so the plow can swing from side to side. Additional lateral swing can be obtained when required, by removing the quick-attachable cotter pin "A" (Illusts. 15 and 16) from the pull bar support.

When operating with middlebusters or cultivators, the lock bolt must be screwed in tightly to keep the unit in a rigid position to prevent the equipment from swinging.

When cultivating crops with high foliage, turn the depth adjusting crank so the hitch bail is set at its highest position. If necessasy the Fast-Hitch pull bar and diagonal links may be removed to provide more clearance under the tractor.

FAST-HITCH LOAD LIMITATIONS

Caution! Do not overload the rear axle or the Fast-Hitch components with the equipment or accessories.

The transport loads listed below are considered satisfactory for Fast-Hitch operation. The equipment weights shown in the following examples do not include any allowance for additional weights on the equipment.

a. Five-foot disk harrow with ten 20-inch disks—360 pounds—use a rear wheel tread setting up to 56-inches.

b. Rotary hoe—355 pounds—use a rear wheel tread setting up to 56-inches.

c. Utility carrier.

International Cub - with a 400 pound payload in the center of the platform - use a rear wheel tread setting up to 56-inches.

International Cub Lo-Boy - use a rear wheel tread setting up to 56-inches with the front tire tubes filled three-quarters full with a calcium chloride solution, the pay load must be proportioned to the amount of front end weight as follows:

Maximum Carrier Payload	Minimum Front End Weight
200 lbs. . .	1 set of one-piece weights (50 lbs.)
250 lbs. . .	1 set of two-piece weights or 2 sets of one-piece weights (100 lbs.)
315 lbs. . .	1 set of two-piece weights and 1 set of one-piece weights (150 lbs.)
375 lbs. . .	1 set of two-piece weights and 2 sets of one-piece weights (200 lbs.)

In general, the loads must decrease as the tread settings increase, and the loads must decrease as the distance from the rear axle to the center of gravity of the load increases.

HITCHING TRAILING EQUIPMENT TO THE TRACTOR

Do not attempt to pull when the drawbar is removed.
Drawbar bolts must be kept tight.
All hitches for trailing implements must be attached to the drawbar.

The tractor exerts its pulling power on trailing-type equipment by means of the drawbar, which is adjustable up and down to accommodate different hitches. Proper hitching will save both the tractor and the equipment it is pulling from undue strains. Hitch so the center line of pull of the tractor will fall in line with, or at least near, the center line of draft of the trailing equipment. Hitching to one side or the other of the line of draft will cause stresses and strains on both the tractor and the equipment being pulled, frequently great enough to do permanent damage. Incorrect hitching will also tend to make the tractor difficult to steer and will result in unsatisfactory work by the equipment being pulled.

When using a long chain to hitch the tractor to the load, drive the tractor forward slowly until all of the slack is taken out of the chain.

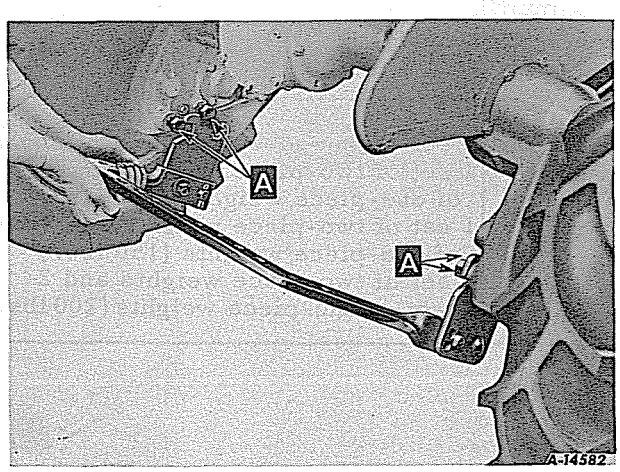


When the tractor is pulling power equipment, be sure that all power line shielding is in place and in good order.

REMOVING THE DRAWBAR

The quick-attachable drawbar can be easily removed. To remove the drawbar, loosen the bolts **"A" (Illust. 18)** and unhook the complete drawbar.

The drawbar on International Cub tractors can be reversed and placed in the forward position when so desired.

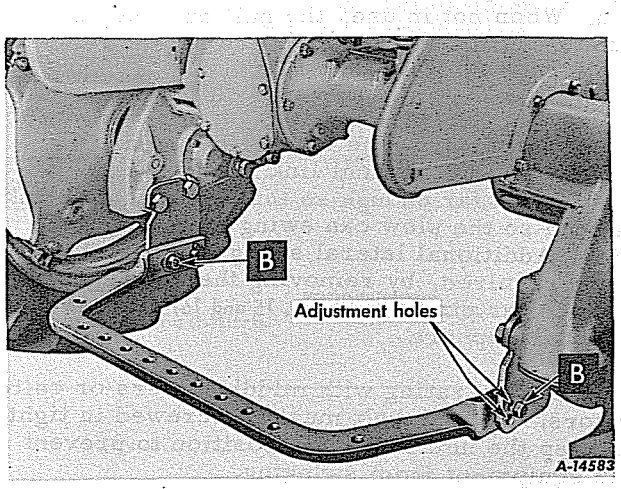


Illust. 18
Removing the drawbar.

ADJUSTING THE DRAWBAR

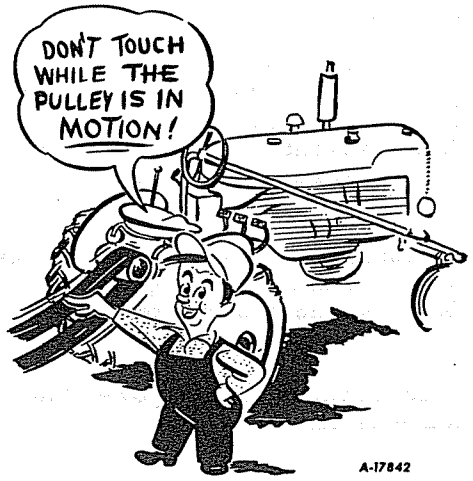
The drawbar can be set at three different heights to obtain the proper hitch position.

To raise or lower the drawbar, remove bolts **"B" (Illust. 18A)**, and raise or lower the drawbar to the upper or lower hole in the drawbar bracket. Replace bolts "B" and tighten securely.



Illust. 18A
Drawbar adjustment.

BELT-PULLEY AND POWER TAKE-OFF

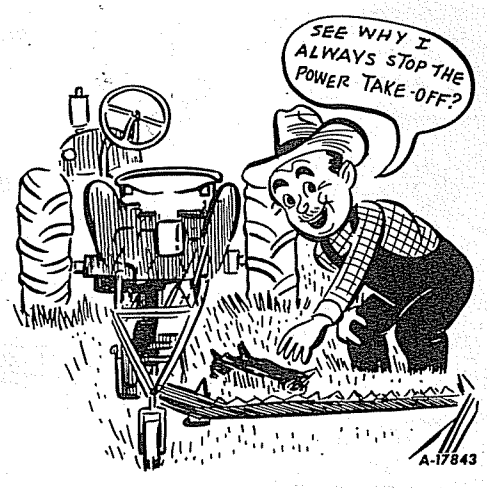


Don't put on or remove the belt from the belt pulley while the pulley is in motion.

If your tractor is equipped with a belt pulley or power take-off, the following instructions and precautions should be carefully studied and followed.

The belt pulley and power take-off are started and stopped by the same engine clutch as the tractor. Be sure to disengage the engine clutch before moving the belt pulley or power take-off shifter rod. The belt pulley is driven by the power take-off shaft; therefore, the same shifter rod is used to operate either the belt pulley or power take-off. The shifter rod should always be in the disengaged (forward) position when the belt pulley or power take-off is not in use.

Note: When the International Cub Lo-Boy tractor is equipped with the Fast-Hitch, the pull bar and support assembly must be disconnected and lowered to the ground by removing the pin "B" at the leveling screw housing and the pin "C" at the lateral link clevises. Then move the diagonal link to one side. **See Illust. 16.**



Always stop the power take-off before dismounting from the tractor.

OPERATING THE BELT PULLEY OR POWER TAKE-OFF WITH THE TRACTOR STANDING STILL

1. The transmission gearshift lever must be in the neutral position.

2. Move the engine speed control lever back to low idle speed.

3. Depress the clutch pedal to disengage the engine clutch.

4. Press down on the shifter rod and move it back to the engaged position; release the shifter rod and allow it to lock in place.

5. Slowly release the clutch pedal.

6. Observe the following instructions when using the tractor belt pulley:

   1. Secure the equipment to receive power in the desired location.

   2. Align the tractor belt pulley with the equipment pulley. Keep the tractor level if possible.

   3. Observe the direction of belt travel indicated on the belt, and install the belt accordingly to prevent damaging it.

   4. Tighten the belt enough to prevent the belt from rubbing against itself during operation. Do this by driving the tractor into the belt, locking the brakes, and blocking the tractor rear wheels. (When using a very long belt or a crossed belt, it will not be possible to eliminate all rubbing).

   5. Gradually bring the tractor engine up to speed, making sure the belt is running true.

Note: Static electricity, generated by belt work, can be discharged harmlessly from tractors with pneumatic tires, by attaching a chain to the tractor and allowing it to touch the ground

For belt and pulley speeds, refer to page 75.

BELT-PULLEY AND POWER TAKE-OFF

OPERATING THE POWER TAKE-OFF WITH TRACTOR IN MOTION

Follow the first four steps outlined above; then release the power take-off shifter rod and allow it to lock in place. Keep your foot pressed down on the clutch pedal (in the disengaged position), advance the engine speed control lever and move the transmission gearshift lever to the speed that is desired to run the tractor. Slowly release the clutch pedal. This will start the tractor in motion with the power take-off in operation.

Caution! When operating power take-off driven machines not equipped with an overrunning clutch (such as a rotary brush cutter), the following precautions should be taken:

Slow down when approaching trees, fences, or ditches. Flywheel effect of the driven machine will drive the tractor forward after the engine clutch is disengaged. To stop the forward travel more quickly, retard the engine speed control lever, disengage the engine clutch, move the gear shift lever to the neutral position, and apply tractor brakes.

CHANGING FROM BELT PULLEY TO POWER TAKE-OFF

Remove two 3/8 N. C. x 1-5/8-inch cap screws "A" **(Illust. 20)** and three 3/8 N. C. x 1-3/8-inch cap screws "B" and remove the belt pulley and housing, complete. Set the belt pulley and cap screws aside for future use.

Replace the removed cap screws with the extra cap screws supplied with the belt pulley and power take-off. Use two 3/8 N. C. x 1-3/8-inch cap screws at "A" **(Illust. 20A)** and the three 3/8 N. C. x 1-1/8-inch cap screws at "B". Use flat washers in front of the lock washers and tighten the cap screws securely.

Caution! Always cover the power take-off exposed shaft with the guard "C" **(Illust. 20A)** when the power take-off is not being used.

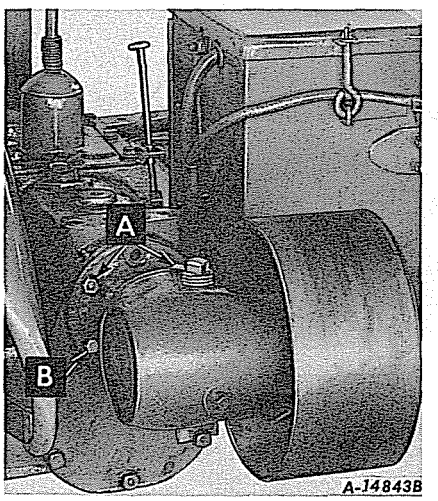
The specifications for the power take-off will be found **on page 74.**

CHANGING FROM POWER TAKE-OFF TO BELT PULLEY

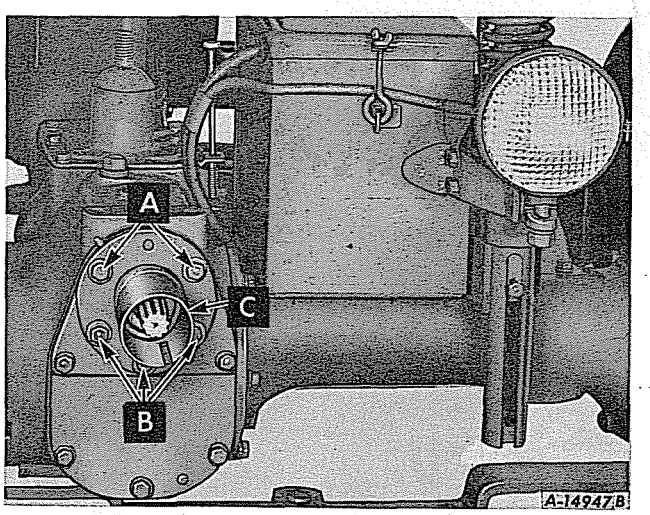
Remove two 3/8 N. C. x 1-3/8-inch cap screws "A" **(Illust. 20A)** and the three 3/8 N. C. x 1-1/8-inch cap screws at "B". Apply a light coating of grease to the power take-off shaft and female spline in the belt pulley housing. Then slide the belt pulley and housing complete on to the power take-off splined shaft.

Insert the two 3/8 N. C. x 1-5/8-inch cap screws with lock washers at "A" **(Illust. 20)** and the three 3/8 N. C. x 1-3/8-inch cap screws with lock washers at "B" and tighten all cap screws securely.

Check the lubricant in the belt pulley housing as instructed in "Lubrication Guide" **on page 71.**



Illust. 20
Belt pulley and power take-off.



Illust. 20A
Power take-off.

COOLING SYSTEM

The thermo-siphon principle is used for circulating water in the cooling system. (The temperature of the water governs the rate of circulation.) Therefore, a thermostat and a water pump are not required.

When the tractor is shipped from the factory it is equipped with a nonpressure-type radiator cap.

A pressure-type radiator cap is available from your International Harvester dealer as a replacement for the regular production radiator cap, if so desired.

Caution must be exercised in removing the pressure-type radiator cap when the water in the cooling system is hot. See instructions in the following section.

The water is circulated through the engine block, cylinder head, and radiator by the thermo-siphon method. As the engine warms up, the water is heated, expands, and circulates back through the radiator where the water is cooled before again circulating through the engine.

When the radiator is equipped with a pressure-type radiator cap, the cooling system operates under pressure which is controlled by means of a regulating valve built into the radiator cap. Always use clean water (soft or rain water if possible).

FILLING THE COOLING SYSTEM

Be sure the radiator drain plug (**Illust. 22**) is closed; then fill the radiator to a level slightly below the bottom of the filler neck, when equipped with a nonpressure-type radiator cap; or to a level approximately 2-inches below the top of the filler neck, when equipped with a pressure-type radiator cap. Filling the radiator to this level will allow for expansion of the coolant under normal operating conditions. Use clean water; soft or rain water is recommended, as it does not contain alkali, which forms scale and eventually clogs passages.

Before replacing the filler cap, be sure to remove any chaff or dirt particles which may be on the gasket surface or cap, and tighten the cap clockwise to the stop.

Note: A pressure-cooled system will not operate properly unless the cooling system is tight.

The gasket surface must be in good condition. The cap must be properly tightened to the stop, and the system must not have loose connections or leaks. Unless these instructions are followed, pressure will not be maintained, and loss of water and consequent overheating will result. When draining the radiator, always remove the filler cap to permit complete drainage.

If the regulating valve is faulty, replace the radiator cap with a new one of the same type.

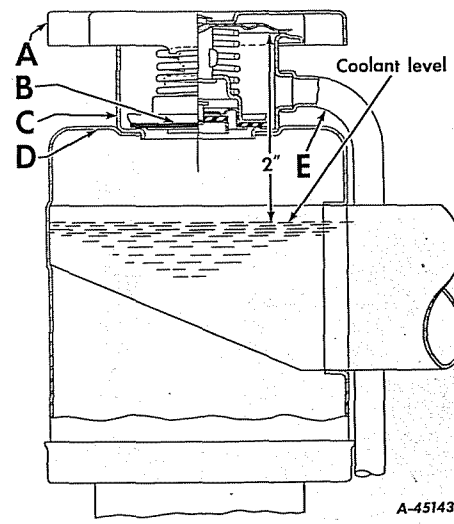
Do not attempt to repair or replace any of the regulating valve parts.

If the engine is to be operated in freezing temperatures, refer to "Cold Weather Precautions."

ADDING WATER TO THE COOLING SYSTEM (When Equipped withe Pressure-Type Radiator Cap)

Caution! If the water in the cooling system is hot and water is to be added, observe the following:

Turn radiator cap "A" (**Illust. 21**) slowly counterclockwise to the safety stop to allow the pressure of any steam to escape; then press down on the cap and continue to turn until the cap is free to be removed.



"A" Radiator cap.
"B" Filler cap gasket.
"C" Filler neck.
"D" Upper water tank.
"E" Overflow pipe.

Illust. 21
Water level in pressure-cooled radiator.

COOLING SYSTEM

ADDING WATER TO THE COOLING SYSTEM (When Equipped with Pressure-Type Radiator Cap) - Continued

Allow the engine to cool and fill the radiator slowly to approximately 2-inches below the top of filler neck "C". Due to expansion, when the system becomes hot, any excess water will be discharged through overflow pipe "E".

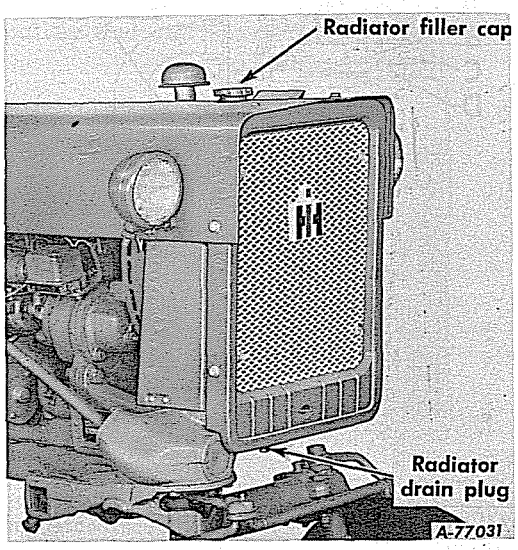
Note: Do not pour cold water into the radiator if the engine is very hot, unless conditions make it absolutely necessary; in which case start the engine, let it idle, and slowly pour water into the radiator.

CLEANING THE COOLING SYSTEM

Twice a year or more often, depending upon the mineral content of the water used, the cooling system should be drained and thoroughly flushed. This is particularly important before using an antifreeze solution.

If the engine is to be operated in freezing temperatures, refer to "Cold Weather Precautions" on page 55. For cooling system capacities, refer to page 74.

Drain the cooling system by removing the plug on the bottom (center) of the radiator (Illust. 22). Allow the system to drain; then replace the plug.



Illust. 22
Cooling system.

RUST PREVENTION

One of the most common causes of engine overheating is a rust-clogged cooling system. Rust interferes with circulation and cooling, which causes overheating.

The practice of flushing the system by forcing water from a hose in the radiator filler neck, without the use of cleaning solutions, may be only a waste of time. Iron corrosion is greater than that of any other cooling system metal, which accounts for the large quantities of rust found in neglected water jackets. Heavy rust deposits in the water jacket hold in heat and create local hot spots, especially around the exhaust valve seats. Under these conditions, the metal may get so hot that the valves will stick or burn, or the cylinder block or head may be damaged by heat cracking.

Unless the cooling water is treated with a corrosion preventive, rust and scale will eventually clog the passages in the radiator and water jacket. This condition is aggravated in some localities by the formation of insoluble salts from the water used.

IH Cooling System Cleaner, dissolves rust, scale, and sludge and retards future corrosion when used according to the directions on the container.

Note: Do not use chemical mixtures to stop radiator leaks except as a temporary measure in an emergency. Instead, have the radiator repaired.

If the radiator is clogged with insoluble salt formations, take it to a reputable concern specializing in the removal of such formations. Reliable radiator service stations are familiar with local conditions and are equipped to apply the proper treatment.

In localities where alkaline, acid, or saline waters are the only kind available, the addition of a rust preventive or "inhibitor" will tend to minimize the corrosive action of such water.

RUST PREVENTION - Continued

For rust prevention during winter use of the engine, a fresh filling of antifreeze containing an effective corrosion preventive should be used. In the spring, drain and discard the old antifreeze solution, as the rust preventive or "inhibitor" may be exhausted from contamination and continued use.

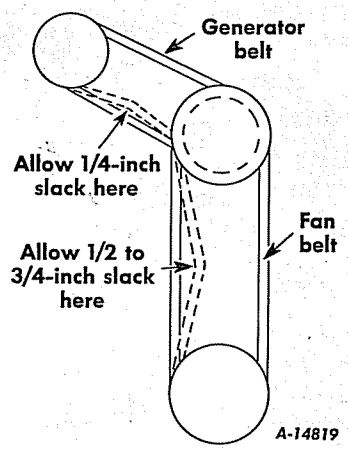
After draining the antifreeze, a rust preventive should be added to the cooling water to protect the cooling system during warm weather operation. This inhibitor solution should be drained and discarded in the fall when danger of freezing again makes necessary the use of an antifreeze.

RADIATOR CORE

Overheating is often caused by bent or clogged radiator fins. If the spaces between the radiator fins become clogged, clean them with forced air or water. When straightening bent fins, be careful not to injure the tubes or break the bond between the fins and tubes.

FAN BELT TENSION

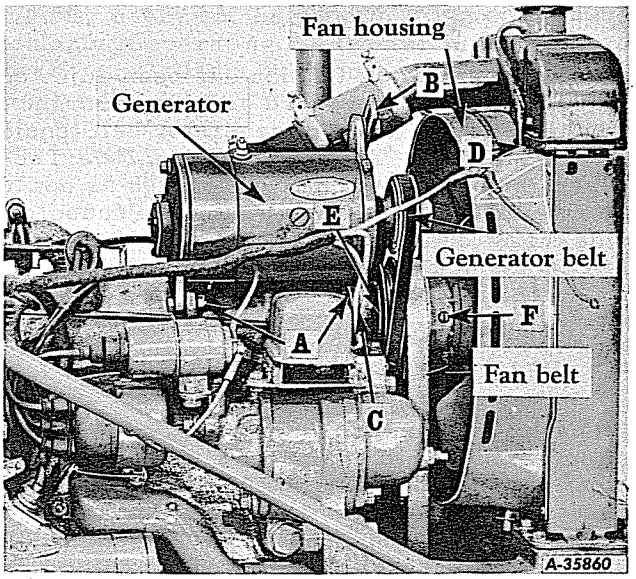
Belts on new tractors (also new replacement belts) lose their tension as they "seat" themselves in the pulleys. New belts should be checked after the first 10 hours of engine operation and every 50 hours of engine operation thereafter to assure maintenance of the correct tension. The tension is correct when the belt can be depressed without effort by the thumb, approximately 1/2-inch to 3/4-inch, midway between the two pulleys. **See Illust. 23.** If the slack is more than 1-inch, adjust the belt as follows:



Illust. 23
Correct belt tension.

Adjusting the Fan Belt

When the tractor is equipped with a generator, first loosen nuts "A" and "B" **(Illust. 23A)**



Illust. 23A
Fan and generator belts.

before adjusting the fan belt tension. The tension of the fan belt is adjusted by loosening fan spindle "C" **(Illust. 23A)** and moving the fan and hub assembly up or down until the correct tension is obtained. After the correct tension is obtained, tighten fan spindle "C". To adjust the generator belt, see "Generator Belt."

After a new belt has been in use approximately 10 hours, check the tension and adjust again if necessary.

Removing the Fan Belt

To remove the fan belt, loosen fan spindle "C" **(Illust. 23A)** and slide the fan and hub assembly to the bottom of the groove on the crankcase front cover. The fan belt can then be slipped over the bottom drive pulley and worked up over the fan blades.

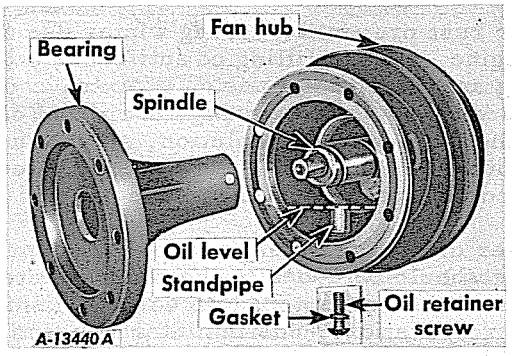
Replacing the Fan Belt

Replace the fan belt when it becomes soaked with grease, or when it is so badly worn that it does not drive the fan at the proper speed.

When replacing the belt, reverse the procedure outlined under "Removing Fan Belt," except that belt can be started on the lower pulley by hand, and by slowly cranking the engine, the belt will find the correct position.

GENERATOR BELT

After the fan belt tension has been adjusted, move the generator toward or away from the engine to get the correct generator belt tension; then tighten nuts "A" and "B" (Illust. 23A). The generator belt should be tight enough as not to allow slippage, but not so tight as to cause side thrust on the generator bearing. Allow 1/4-inch slack. See Illust. 23.



Illust. 24
Fan hub partially disassembled showing oil level.

FAN HUB LUBRICATION

Every six months or after every 500 hours of operation, whichever occurs first, remove oil retainer screw "F" (Illust. 23A) and turn the fan assembly so that the oil filler hole is at the right horizontal position. Add engine oil until the oil reaches the level of the hole. Now turn the assembly so that the hole is on the bottom and allow any excess oil to drain out. The oil is then up to level of the top of the stand pipe (approximately 1-1/2 ounces). See Illust. 24. Replace the oil retainer screw and be sure that the retainer screw gasket is in place.

Note: The rubber gasket located behind the hub at "E" (Illust. 23A) is used for shipping purposes only. It does not have to be replaced when worn out.

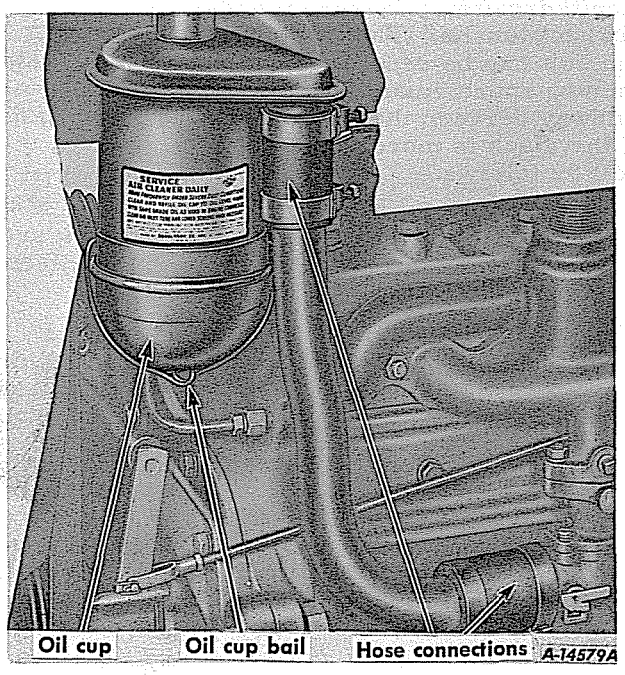
AIR CLEANING SYSTEM

Clean air for combustion is assured by an oil-type air cleaner. A heavy screen in the air intake cap prevents large particles from entering the air cleaner. The air then passes to the oil cup where it goes through a bath of oil. As the air rises to the intake manifold, it passes through a series of oil-bathed screens and the fine dust is removed. As the oil from the screen works back down, it carries the dirt with it and settles in the oil cup. **Never allow dirt to build up in the cup more than 1/2-inch deep.**

OIL CUP SERVICE

Clean and refill the oil cup every day, or every 10 hours of operation (more frequently when operating under dusty conditions). Refill the oil cup to the oil level bead with the same grade of oil used in the engine crankcase. For the oil cup capacity, refer to page 65.

Do not remove the oil cup while the engine is operating. Before replacing the oil cup, clean or wipe oil or grit from the top bead of the oil cup.

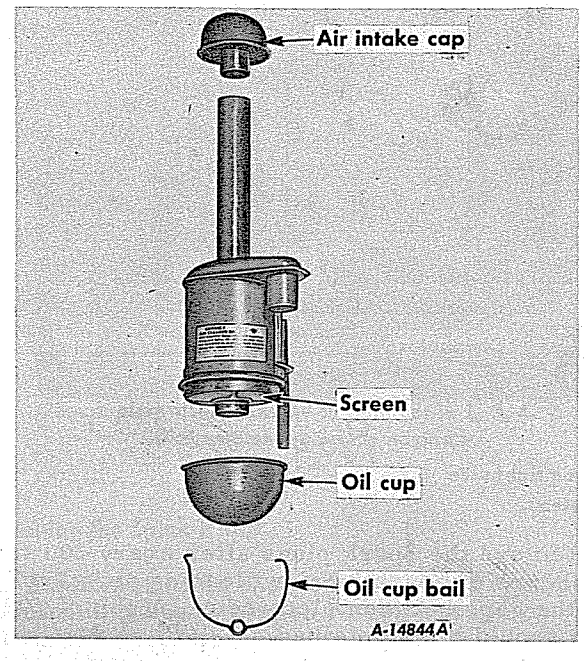


Illust. 24A
Servicing the oil cup.

AIR CLEANING SYSTEM

AIR INTAKE CAP AND SCREEN

The screen in the air intake cap prevents chaff and other coarse dirt from getting into the air cleaner. Keep this screen clean and free from all chaff, oil, dust, or paint, as clogged holes in the screen will reduce the power of the engine by restricting the flow of air.



Illust. 25
Exploded view of air cleaner.

WASHING THE CLEANER

After every 150 hours of operation — particularly if operating the tractor in an atmosphere heavily laden with dust, chaff or lint — remove the entire air cleaner from the tractor, disassemble it (**Illust. 25**) and wash the parts thoroughly in kerosene. Be sure to clean out the air intake pipe.

After all parts have been thoroughly cleaned, replace the air cleaner body on the tractor. Make sure all joints are airtight. Replace the air intake cap. Fill the oil cup to the proper level with the specified grade of oil and replace it on the air cleaner. Be sure it is held securely in place by the oil cup bail or clamp.

GENERAL PRECAUTIONS

As an added precaution against dirt entering the engine, frequently inspect the flexible rubber hose connections between the carburetor and the air cleaner. If they show any sign of deterioration, replace them. To eliminate strain on the rubber hose connections, be sure the pipes line up. All joints between the air cleaner, carburetor, manifold and cylinders of the engine should be tight. All gaskets must be in good condition and the bolts should be drawn up tight.

CRANKCASE BREATHER

The crankcase breather and oil filler cap (**Illust. 7**) has an oiled aluminum crimp filler which acts as a dust filter for crankcase ventilation. Clean and reoil this breather each time the engine oil is changed.

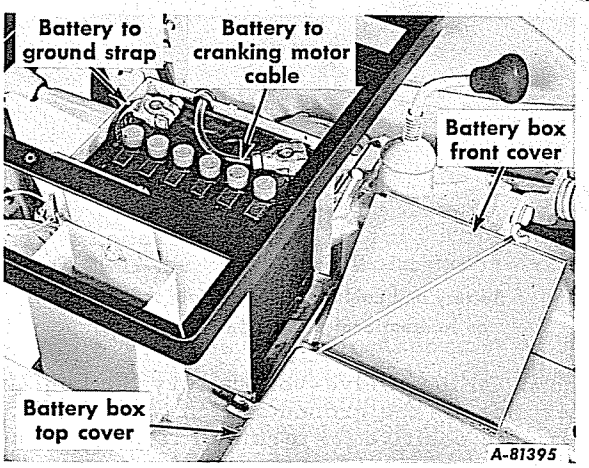
ELECTRICAL SYSTEM

International Cub Tractors with serial numbers 224401 and up or International Cub Lo-Boy Tractors with serial numbers 18701 and up are equipped with a twelve volt electrical system.

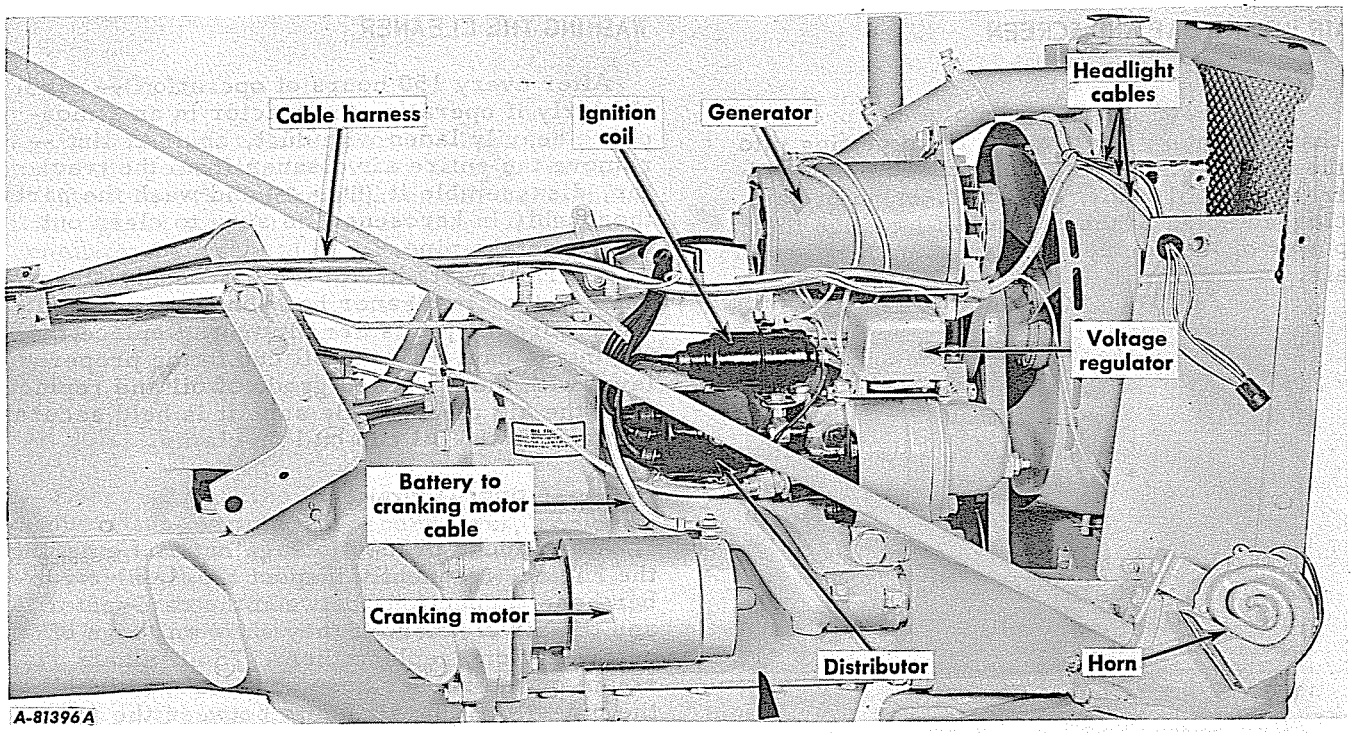
International Cub Tractors with serial numbers below 224401 or International Cub Lo-Boy Tractors with serial numbers below 18701 are equipped with a six volt electrical system.

The electrical system of the tractor consists of a generator, voltage regulator, cranking motor, lights, lighting switch, electrical instruments, a battery, and either a magneto or a battery ignition unit. Colored plastic-covered cables are contained in a harness of nonmetallic, oilproof, and waterproof woven braid.

Use the illustrations on pages 25 and 26, and the wiring diagrams on pages 35 to 41 as a guide for identifying the various electrical units and for tracing the electrical cables and connections. Be sure all terminals are clean and securely fastened.



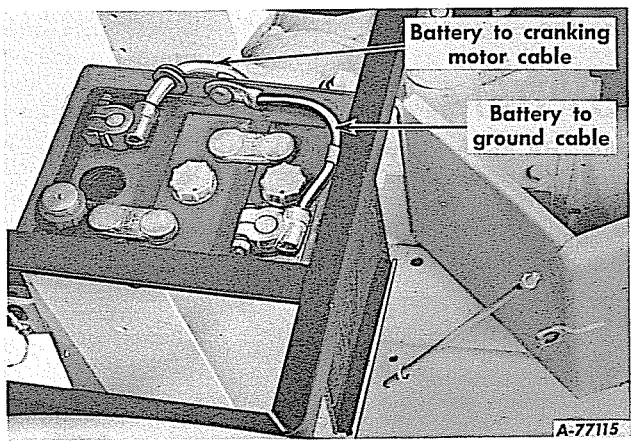
Illust. 25A
Deluxe seat and battery box covers removed for servicing the battery (12-volt system).



Illust. 26
Electrical units and cables on right side of engine (12-volt system).

Plug. 23

When the electrical equipment was installed at the factory, the battery-to-ground cable was left disconnected and taped. Before attempting to start the tractor, make certain that the ground cable is connected.



Illust. 26A
Battery and cables (6-volt system shown on International Cub LoBoy Tractor).

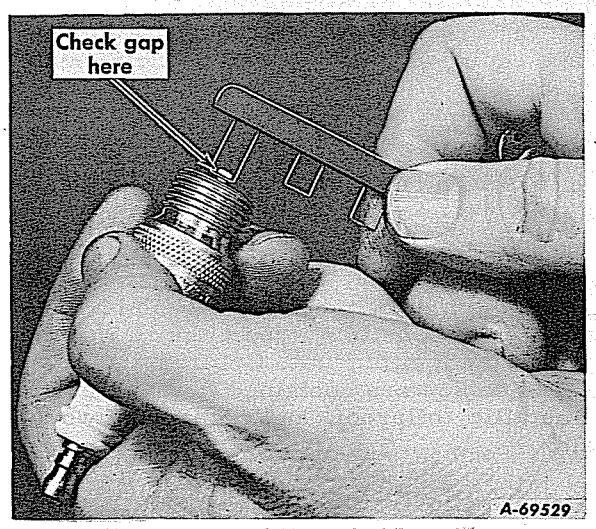
Note: On the twelve-volt battery the negative (-) terminal is the ground and on the six-volt battery the positive (+) terminal is the ground.

SPARK PLUGS AND CABLES

Note: Remove all dirt from the base of the spark plug before removing the spark plug.

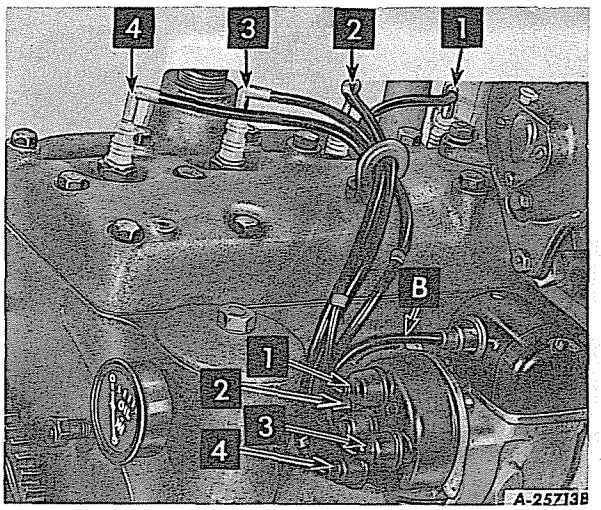
Remove the spark plugs after every 200 to 300 hours of operation for cleaning and checking the gaps between electrodes. A gap of .023 inch should be maintained.

When making this adjustment, always bend the outer electrode. Never bend the center electrode, as it will damage the insulator. If the gap between the electrodes is too great, due to improper setting or burning off of the ends, the engine will misfire and be hard to start.



Illust. 26B
Checking the spark plug gap.

SPARK PLUGS AND CABLES - Continued



Illust. 27
Spark plug wiring. Engine firing order is 1, 3, 4, 2. (Magneto shown on the engine.)

Cleaning the Spark Plugs

Sandblasting is the recommended method of cleaning spark plugs. Never scrape or clean the insulator with anything which will scratch the porcelain. Scratched porcelain allows carbon and dirt to accumulate much faster.

Always use a spark plug wrench when removing or replacing plugs. This helps to prevent cracking the porcelain.

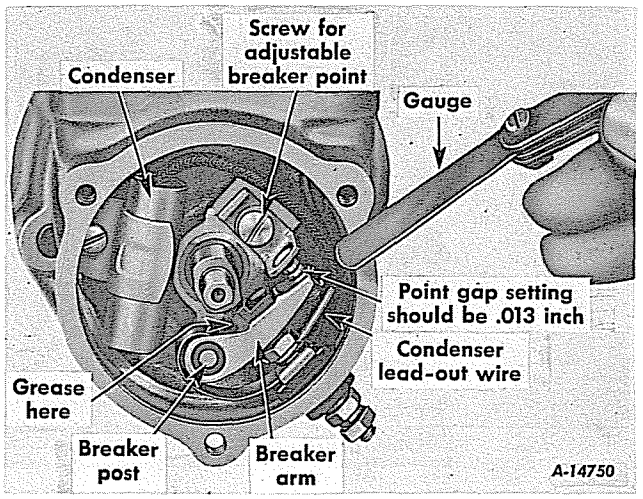
Screw the spark plugs into the cylinder head, using a new copper gasket with each one. Do not tighten more than enough to compress the gasket to seal the plug and assure a good heat transfer between the plug and the cylinder head. Torque the spark plugs to 34 foot-pounds torque. If a torque wrench is not available, tighten the plug 1/2 to 3/4 turns past finger tight. Replace defective plugs with new plugs.

See your International Harvester dealer for various makes of replacement plugs for normal or special service. These plugs have been tested and recommended as best suited for this engine.

If the spark plug cables are removed for any reason, note the position of each cable on the distributor cap as shown in Illust. 27.

MAGNETO

Greasing the Breaker Mechanism and Checking the Points



Illust. 27A
Adjusting the breaker points.

It is important that the breaker chamber be kept clean, as oil on the breaker points will cause rapid burning. Inspect the breaker chamber after every 250 hours of operation, to assure that it is clean. To reach the breaker mechanism, remove the distributor cap, and crank the engine slowly until end "B" of the distributor rotor arm points toward the No. 1 terminal on the distributor cap, and the impulse coupling just trips. Take off the distributor body by removing three screws "A" (Illust. 28). See that the points are in good condition and have the proper clearance. If the chamber is clean, no attention is necessary other than checking the clearance of the points, but if the chamber is dirty, all parts must be thoroughly cleaned.

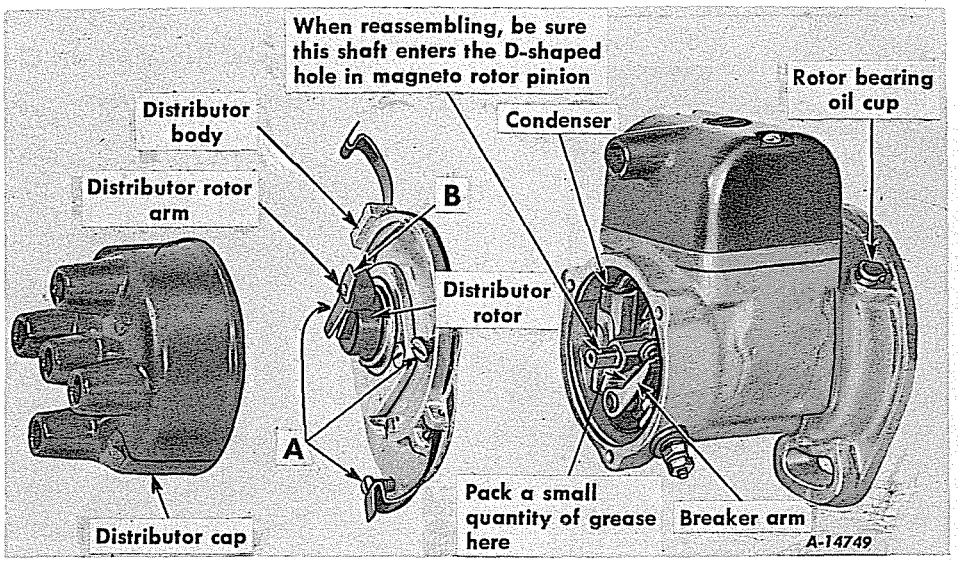
Do not crank the engine while distributor body is removed or it might be necessary to retime the magneto to the engine.

Remove the breaker arm from the chamber and clean all parts. Inspect the breaker points and, if necessary, dress them with a sharp, fine file. If the points are worn excessively, replace both points.

Fill the recess in the breaker post with IH High Temperature Grease (21372-D) and pack a small quantity of the same grease in back of the breaker arm rubbing block (Illusts. 27A and 28). See your International Harvester dealer for the proper grease to use.

Replace the breaker arm and be sure the points line up when the breaker arm is in place.

MAGNETO - Continued



Illust. 28
Magneto disassembled.

Greasing the Breaker Mechanism and Checking the Points - Continued

Check the opening between the breaker points (Illust. 27A) with a feeler gauge. The point opening should be .013 inch when the rubbing block is on the high part of the cam. If the opening is not correct, adjust it by loosening the screw holding the adjustable point (Illust. 27A) and moving the point up or down until the gauge slips snugly into the opening. After the proper adjustment has been made, tighten the screw.

With the engine on the top dead center of the No. 1 firing stroke, turn the distributor rotor until end "B" of the distributor rotor arm points to the No. 1 terminal on the distributor cap. Place the distributor body on the magneto and be sure the rotor shaft enters the "D" shaped hole in the magneto rotor pinion. Be sure the gasket is in place and tighten three screws "A" (Illust. 28). Replace the distributor cap.

Greasing the Distributor Gear

After every 2,000 hours of operation or at least every year, the distributor gear and distributor gear chamber should be cleaned and repacked with IH Magneto Ball Bearing Grease (359 766 R91). We recommend this be done by your International Harvester dealer.

Distributor Cap

Every three or four months, remove the distributor cap and examine the inside. If any dust, moisture or oil deposits are present, thoroughly clean and wipe dry. To assure long life of the distributor, care must also be taken to keep the three small ventilator holes in the bottom of the distributor cap open at all times. Also see that the distributor rotor is kept clean.

If the distributor cap terminal nipples are removed, be sure that the terminals and coil cover terminals are clean and dry.

The magneto is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.

Magneto Impulse Coupling and Magneto Drive Chamber

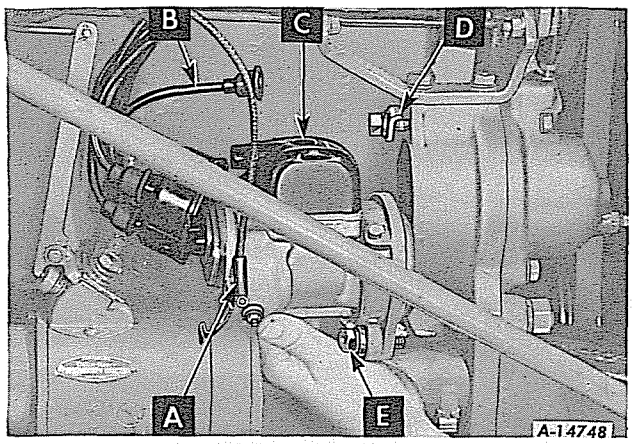
When the engine is hand-cranked, the impluse coupling should trip (click) twice for each revolution of the engine. Failure to do so indicates the need of cleaning or service.

Remove the magneto as described below. Hold the magneto at an angle of approximately 45 degrees, and flush the impulse coupling and magneto drive chamber with kerosene. During warm weather, oil the impulse coupling liberally with light oil, such as cream separator or sewing machine oil. Do not use oil during cold weather (below +10 degrees F.). Flushing with kerosene is all that is required.

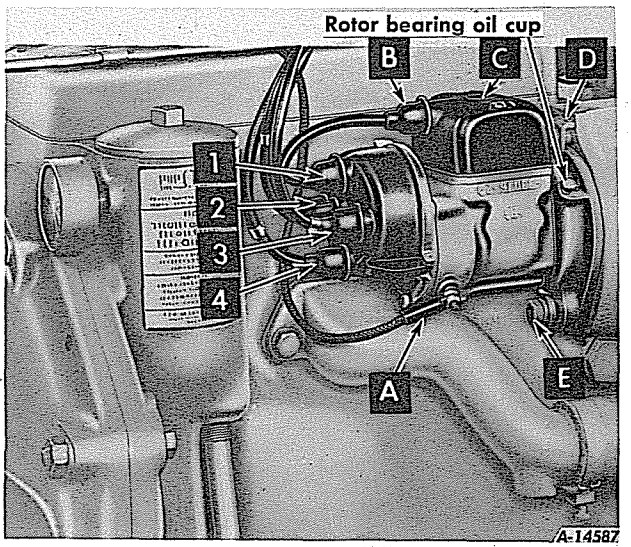
If it is necessary to remove the impulse coupling from the magneto for cleaning or service, we recommend that this be done by your International Harvester dealer.

MAGNETO - Continued

Removing the Magneto



Illust. 29
Removing the magneto.



Illust. 29A
Magneto wiring (clockwise rotation).
Firing order 1,3,4,2.

1. Disconnect switch cable "A" (Illust. 29) by removing the nut and lock washer attaching the cable to the magneto terminal.

2. Pull out cable "B" from coil cover "C" and remove the distributor cap.

3. Loosen the nut holding magneto mounting clip "D" and remove cap screw "E". The magneto assembly can then be removed. See Illust. 29.

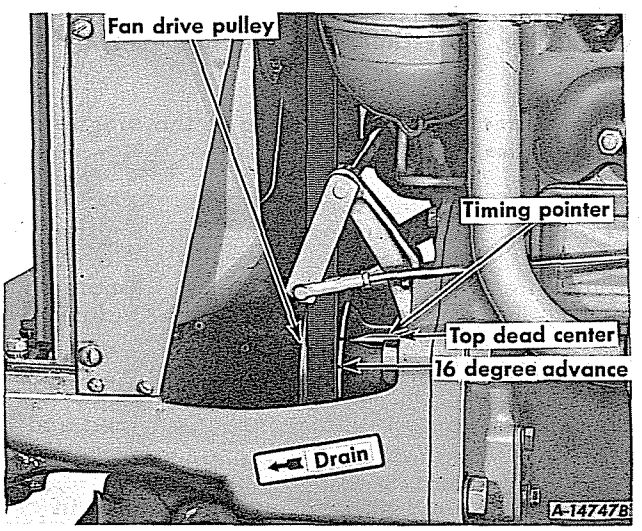
Installing and Timing the Magneto to the Engine

1. Crank the engine until the No. 1 piston (the piston next to the radiator) is on the top dead center of the compression stroke. The compression stroke can be determined by removing the No. 1 spark plug, placing the thumb over the opening, and cranking the engine until an outward pressure is felt. Continue cranking slowly until the top dead center mark (second notch on the back flange of the fan drive pulley at the left side of the engine) is in line with pointer on crankcase front cover. See Illust. 29B. Both intake and exhaust valves will now be closed.

2. Turn the magneto impulse coupling (Illust. 30), in a counterclockwise direction (as viewed from the coupling end) until end "B" of the distributor rotor arm points toward the No. 1 terminal on the distributor cap. See Illust. 28. Then replace the distributor cap.

3. Assemble the magneto on the engine, making sure that the lugs on the impulse coupling engage in the slots on the magneto drive coupling. (Assemble the magneto so that the top is as close to the crankcase as possible.)

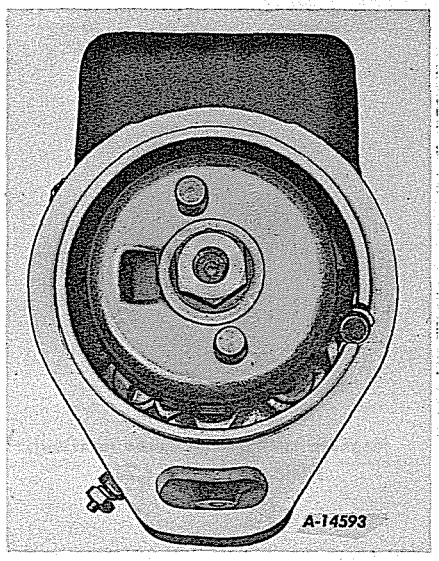
4. Insert magneto mounting bolt "E" loosely in the magneto flange, just enough to hold the magneto in place. Then crank the engine one complete revolution to the next top dead center. Now pull the upper part of the magneto away from the engine until the impulse coupling just trips.



Illust. 29B
Notches on the fan drive pulley and the timing pointer.

MAGNETO - Continued

Installing and Timing the Magneto to the Engine - Continued



Illust. 30
Magneto removed showing impulse coupling.

5. Tighten mounting clip nut "D" and bolt "E" (Illust. 29) securely. If the spark plug cables have been removed for any reason, attach the cables to the engine and magneto. Start by connecting the No. 1 cylinder spark plug to the socket marked "1" on the distributor cap in Illust. 27). Then connect the No. 3 socket with the No. 3 cylinder; next the No. 4 socket with the No. 4 cylinder, and last, the No. 2 socket with the No. 2 cylinder. See Illusts. 27 and 29A.

6. Connect the switch cable to the magneto terminal. See "A", Illust. 29.

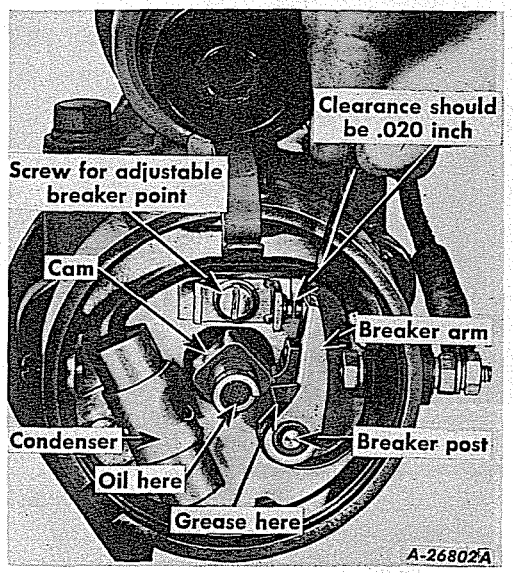
7. To check the timing, crank the engine slowly until the top dead center of the No. 1 cylinder is reached; at this time the impulse coupling should just trip. Never time before top dead center.

8. The magneto is now correctly wired and timed.

9. Push cable "B" back into the socket in the coil cover. See Illust. 29A.

DISTRIBUTOR AND COIL UNIT

Greasing the Breaker Mechanism and Checking the Points



Illust. 30A
Adjusting the breaker points.

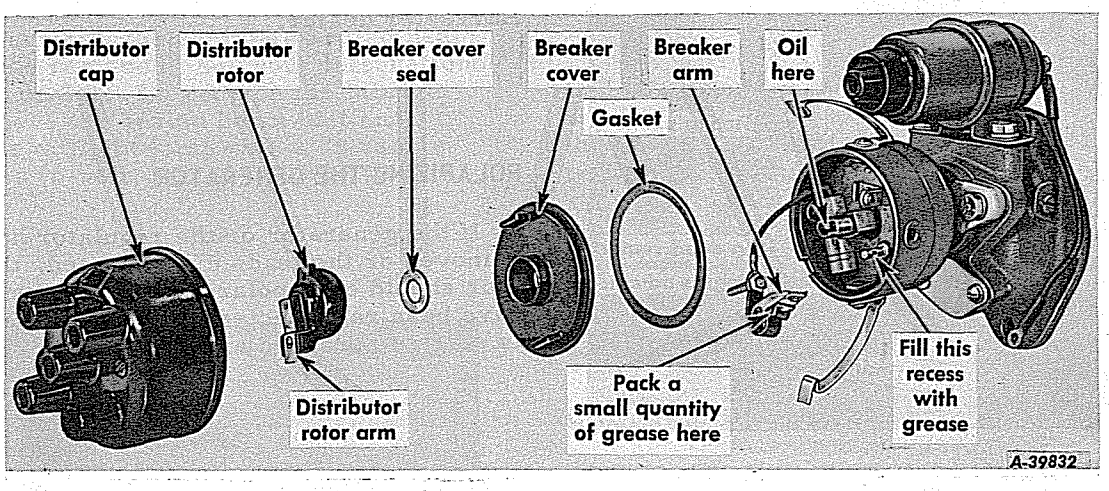
It is important that the breaker chamber be kept clean because oil on the breaker points will cause rapid burning. Remove the distributor cap, distributor rotor, and the breaker cover for breaker chamber inspection. See Illust. 30A. Care should be taken, when removing the breaker cover, to keep dirt from entering the breaker chamber. Be sure the chamber is clean and that the breaker points are in good condition and have the proper opening.

Never use emery cloth or sandpaper to clean the points. To dress the points, use a sharp fine file. If the points are worn excessively, replace both points.

Fill the recess in the breaker post with IH High Temperature Grease (21372-D) and pack a small quantity of the same grease in back of the breaker arm rubbing block and apply a light coating of the same grease on the lobes and flats of the breaker cam. See Illusts. 30A and 31. See your International Harvester dealer.

DISTRIBUTOR AND COIL UNIT - Continued

Greasing the Breaker Mechanism and Checking the Points - Continued



Illust. 31
Distributor partially disassembled for servicing.

Points .20

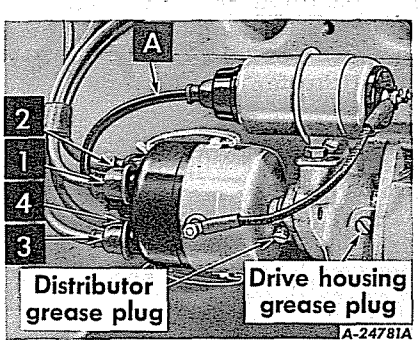
Check the condition of the breaker points for build-up or lip formation. If present, the points must be dressed before the point opening can be checked or set. Check the opening between the breaker points with a feeler gauge as shown in **Illust. 30A.** The point opening should be .020 inch when the rubbing block is on the high part of the cam. If the opening is not correct, adjust it by loosening the screw holding the adjustable point. Then move the point toward or away from the point on the breaker arm until the gauge slips snugly into the opening. After the adjustment has been made, tighten the screw.

If the spark plug cables have been removed for any reason, attach the cables to the spark plugs and to the terminal sockets of the distributor cap in the following order: The No. 1 cylinder spark plug cable to the socket marked "1" in **Illust. 31A.** Then, going around the distributor cap in a clockwise direction, attach the cable from the No. 3 spark plug to the next or second socket, the cable from the No. 4 spark plug to the next or third socket, and the cable from the No. 2 spark plug to the fourth or last socket. Assemble the secondary cable "A" in the distributor cap. **See Illust. 31A.**

Distributor Cap

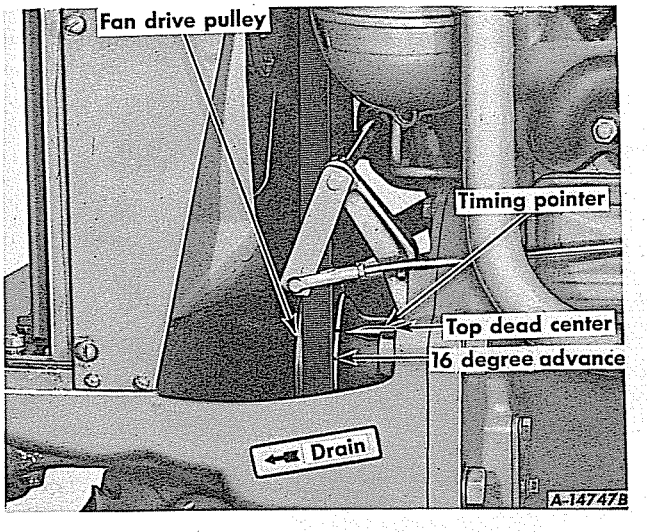
Every three or four months, remove the distributor cap and examine the inside. If any dust, moisture, or oil deposits are present, thoroughly clean and wipe dry. Also see that the distributor rotor is kept clean.

If the terminal nipples are removed, be sure the distributor cap terminals and coil terminal are clean and dry. The distributor is equipped with these nipples to prevent any external electrical leakage when the tractor is operating under adverse conditions.



Illust. 31A
Distributor wiring and lubrication.

POWER TIMING LIGHT



Illust. 32
Notches on the fan drive pulley and the timing pointer.

A final check and adjustment of the ignition should be made with a neon-type flashing timing light synchronized to the ignition system and directed at the timing mark on the rear flange of the crankcase fan drive pulley. See your International Harvester dealer for this service.

IGNITION COIL

The ignition coil does not require special service other than to keep all terminals and connections clean and tight.

GENERATOR AND REGULATOR

The generator supplies current to keep the battery in a charged condition, replacing the energy consumed by the cranking motor and lights. It is hinge-mounted on the right side of the engine crankcase and is driven by a V-belt from the fan pulley.

The generator charging rate is controlled by a voltage regulator which controls the generator output, thereby maintaining a satisfactory charging rate, and prevents overcharging the battery under varying temperatures and operating conditions. It should not require adjustment or attention. If the regulator fails to operate correctly, see your International Harvester dealer.

POLARIZING THE GENERATOR

If the generator or the regulator has been removed or the leads disconnected, the generator should be repolarized. After the leads have been reconnected, but before the engine is started, proceed as follows:

After making certain that the grounded battery terminal is the negative (-) terminal (on the twelve-volt system) or the positive (+) terminal (on the six-volt system) momentarily connect a jumper lead between the "BAT" and the "GEN" terminals of the regulator. This allows a momentary surge of current to flow through the generator which correctly polarizes it. Reversed polarity may result in vibration, arcing, and burning of the relay contact points.

GENERATOR BELT TENSION

The tractors have separate fan and generator belts. To check, adjust, or replace the belts, refer to pages 23 and 24.

HEADLIGHTS

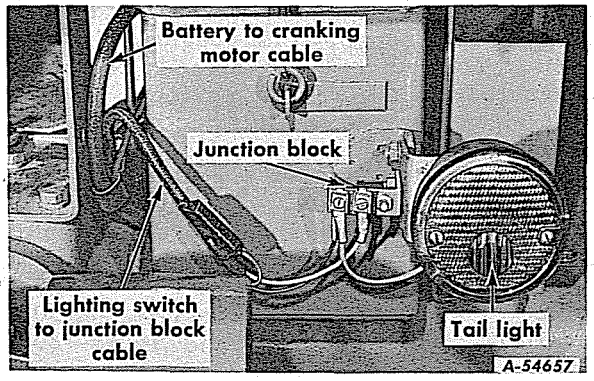
The headlights are sealed-beam lights especially developed for tractor operations. The parts are so constructed that the filament, reflector, and lens are all assembled in a unit permanently sealed against dirt, moisture, and corrosion. If a filament burns out or a lens breaks, the complete unit must be replaced. See your International Harvester dealer.

ELECTRICAL SYSTEM

COMBINATION REAR LIGHT AND TAILLIGHT

The combination rear light and taillight is turned on by the lighting switch on the instrument panel and gives you a choice of red as a taillight for highway use or white as a rear light for field use. Should a lens break, or a filament burn out, the complete sealed beam unit must be replaced. See your International Harvester dealer. To replace the taillight lamp, remove the sealed beam unit and replace the taillight lamp with a 15 candle power lamp (6-volt, No. 454 493 or 12-volt, No. 455 590).

TAILLIGHT



Illust. 33
Taillight (6-volt system).

To replace the taillight lamp remove the red lens from the taillight and replace defective lamp with a new 3 candle power lamp (6-volt, No. 142 303 or 12-volt, No. 142 450).

WARNING LIGHT

A flashing warning light is located at the left rear side of the tractor. This light is for use on public highways to warn operators of other vehicles that they are approaching a slow moving vehicle.

Tractors with Electric Starting and Warning Light: The light will automatically flash whenever the lighting switch is in the "ON" position.

Tractors with Electric Starting and Lighting: The light will automatically flash whenever the red taillight is "ON".

If local laws do not approve the use of a flashing light, remove the two-unit multiple connector from the flasher unit and connect the 6-inch jumper to the two-unit connector. This will provide a steady light.

FUSE

A cartridge-type fuse is located in the fuse housing. If a short circuit occurs in the lighting circuit, the fuse will burn out and break the circuit, preventing damage to the electrical system.

It is important to use the same capacity fuse for replacement. See "Specifications" on page 75. If the lights fail, check the fuse. If the fuse continually burns out, check the electrical wiring for short circuits.

To install a new fuse, unscrew the fuse holder on the instrument panel, pull out the old fuse and replace it with a new one.

STORAGE BATTERY

Cleaning and Servicing the Battery

Occasionally remove the battery cable and ground cable, brighten the terminal contact surface with wire wool, and reassemble. Then apply a light coat of vaseline or chassis lubricant. Be sure the terminals are clamped tightly and that the battery is fastened securely to the battery support. Replace damaged cables. Keep the vent holes in the battery filler caps open.

Liquid Level

Check the battery at least once a month for water level. If the battery is in need of charging, it should be given immediate attention. Keeping the battery fully charged not only adds to its life but makes it available for instant use when needed.

The electrolyte (acid and water) in each cell should be at the proper level at all times to prevent battery failure. When the electrolyte is below this level, pure, distilled water should be added.

Acid or electrolyte should never be added except by a skilled battery man. Under no circumstances add any special battery "dopes", solutions, or powders.

Caution! Electric storage batteries give off highly inflammable hydrogen gas when charging and continue to do so for some time after receiving a steady charge.

Caution! Do not under any circumstances allow an electric spark or an open flame near the battery. Do not lay tools across battery terminals as this may result in a spark or short circuit which may cause an explosion. Be careful to avoid spilling any electrolyte on hands or clothing.

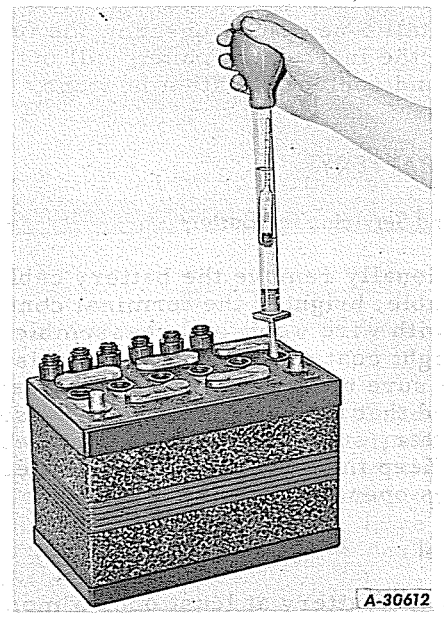
STORAGE BATTERY - Continued

Liquid Level - Continued

For dependable battery service see your International Harvester dealer.

Specific Gravity

The specific gravity of the electrolyte indicates the relative condition of the battery charge and warns when it may be necessary to recharge the battery.



Illust. 34
Taking a hydrometer reading of electrolyte in the battery (12-volt shown).

Inspect the battery once every two weeks to maintain the correct specific gravity. The specific gravity of a fully charged battery is 1.255 to 1.270 corrected to +80°F. (liquid temperature). A specific gravity reading of at least 1.230 corrected to +80°F. should be maintained. Never allow the battery to fall below 1.230.

The specific gravity reading will vary with the temperature of the electrolyte. For readings taken at any temperature other than +80° F., a temperature correction must be applied. This is done by adding .004 specific gravity for every 10° above +80°F., and by subtracting .004 specific gravity for every 10° below +80°F.

Example No. 1

Hydrometer reading	1.270
Electrolyte temperature	+20°F.
Subtract .024 Sp. Gr.	(.004x6)
Corrected Sp. Gr. is	1.246

Example No. 2

Hydrometer reading	1.255
Electrolyte temperature	+100°F.
Add .008 Sp. Gr.	(.004x2)
Corrected Sp. Gr. is	1.263

Use an accurate hydrometer when testing for specific gravity. Readings should not be taken immediately after adding water. All cells should show approximately the same specific gravity reading. Wide variations indicate something is wrong.

Cold Weather Operation

It is especially important to keep the battery close to full charge for cold weather operation. Add water to the battery in freezing temperatures only when the tractor is to operate for several hours, to thoroughly mix the water and electrolyte, or damage to the battery will result from the water freezing.

The electrolyte of a battery in various stages of charge will start to freeze at temperatures indicated below:

Specific Gravity (Corrected to +80°F.)	Freezing Temperature Degrees Fahrenheit
1.265	-80°F.
1.220	-30°F.
1.210	-20°F.
1.180	-10°F.
1.160	- 0°F.
1.140	+10°F.
1.100	+20°F.
1.000	+30°F.

The temperatures shown indicate the approximate points at which the first ice crystals begin to appear in the solution. The solution does not freeze solid until a lower temperature is reached.

A battery three-fourths charged is in no danger of damage from freezing. Therefore keep the battery better than three-fourths charged, especially during winter weather.

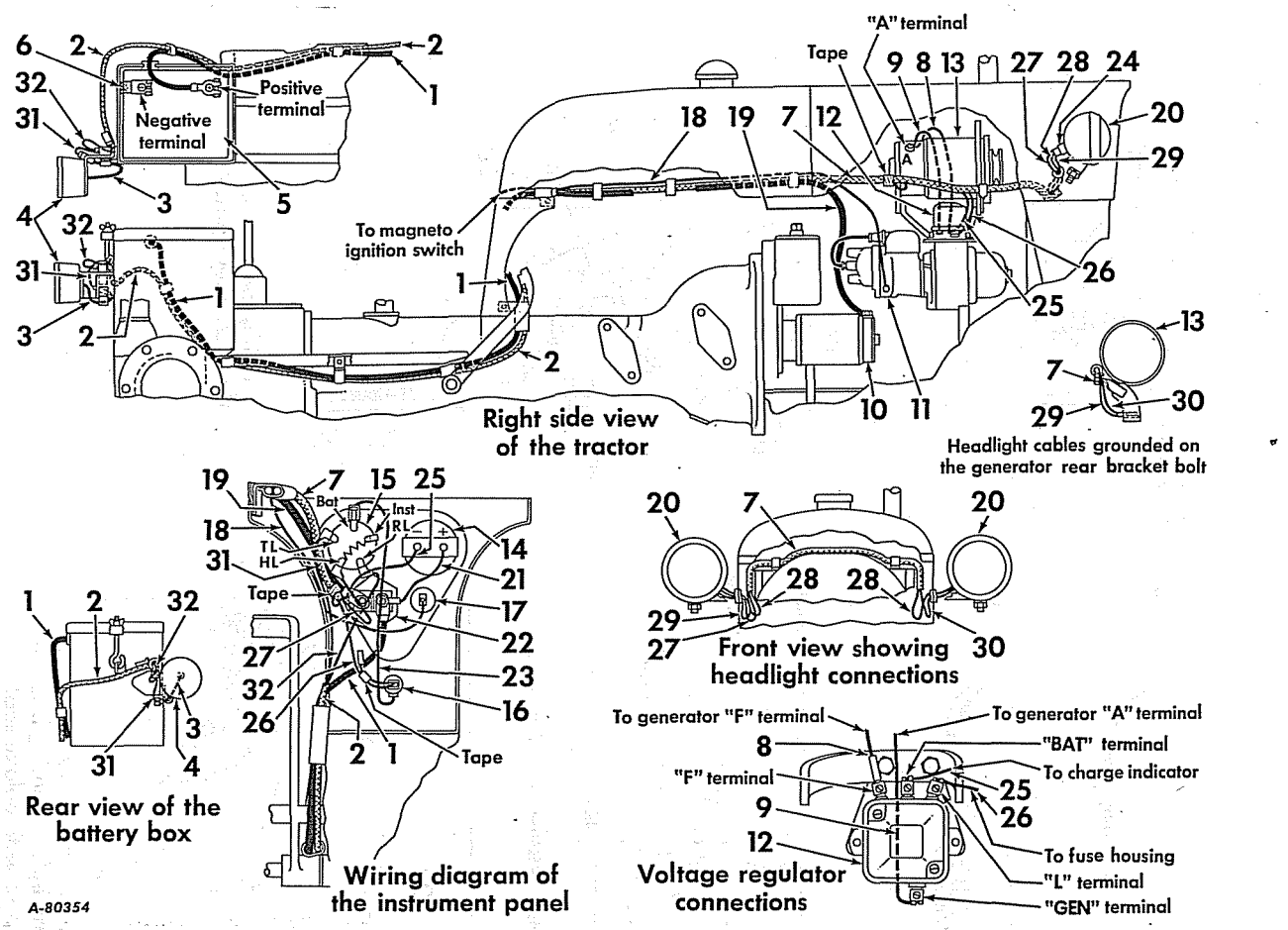
If your tractor is not to be operated for some time during the winter months, it is advisable to remove the battery and store it in a cool, dry place above freezing (+32°F.). Place the battery on a rack or bench.

Ground Cable

When replacing a battery, make certain that the ground cable is connected to the negative (-) terminal (on the twelve-volt battery) or to the positive (+) terminal (on the six-volt battery).

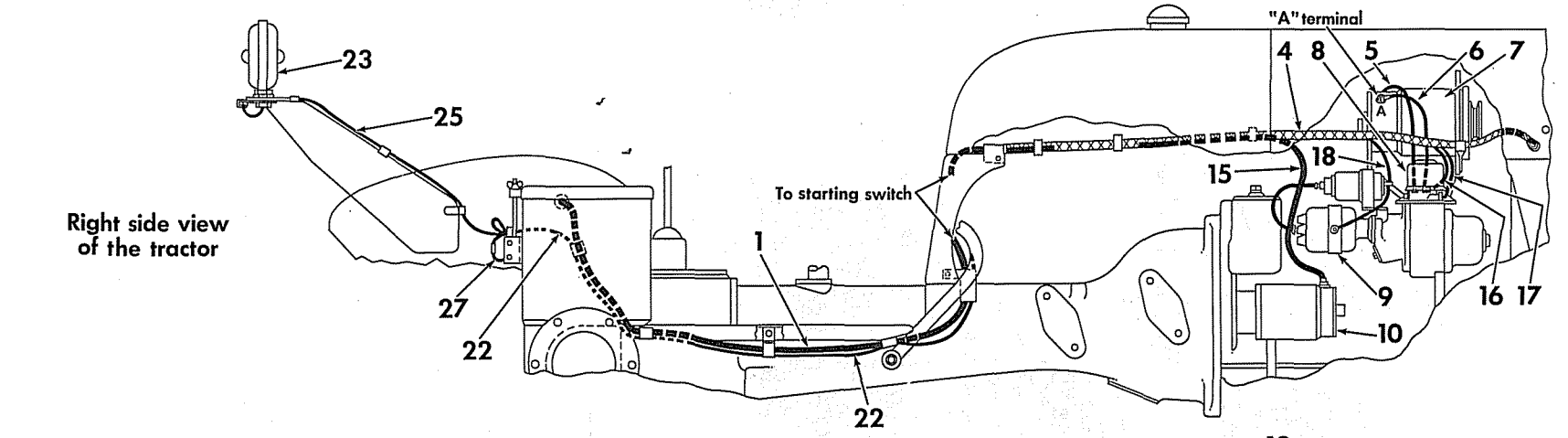
Note: Before working on any part of the electrical system, disconnect the battery ground cable from the battery terminal. Do not reconnect it until all electrical work has been completed. This will prevent shorting and causing damage to any of the electrical units.

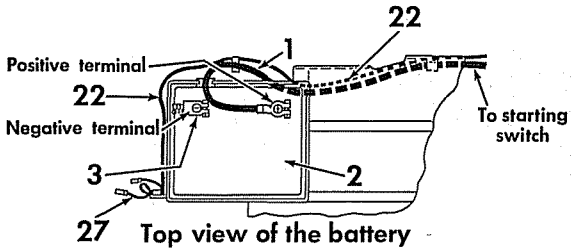
ELECTRICAL SYSTEM

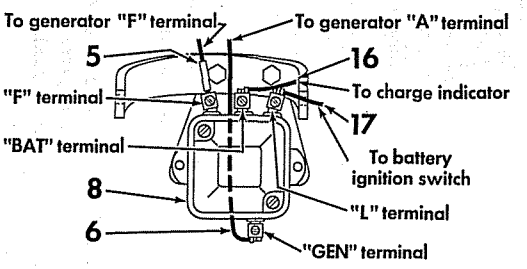


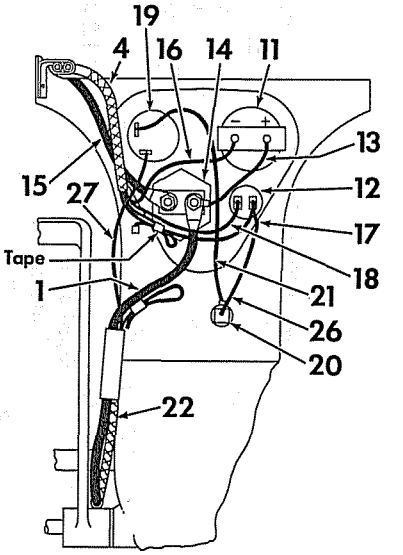
Illust. 35
Electric starting and lighting wiring diagram for tractors equipped with magneto ignition (12-volt electrical system).

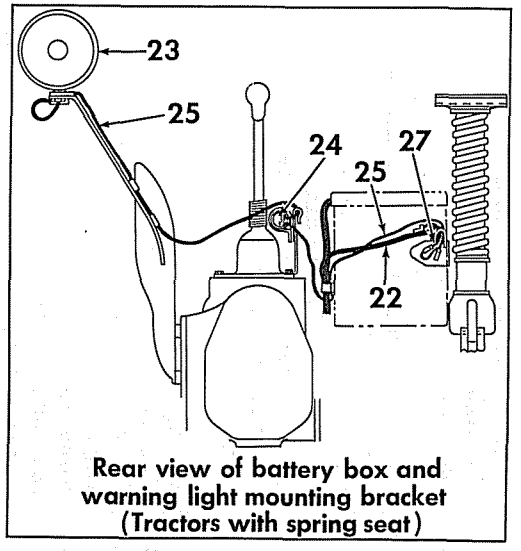
Ref. No.	Description	Ref. No.	Description
1	Cable - battery to starting switch	19	Cable - starting switch to cranking motor
2	Cable harness - rear light	20	Headlights
3	Cable - taillight to connector	21	Cable - starting switch to charge indicator
4	Taillight	22	Starting switch
5	Battery	23	Cable - fuse housing to lighting switch
6	Strap - battery to ground (ground on battery box rear left mounting bolt)	24	Connector body - assemble to headlight cables
7	Cable harness	25	Cable - regulator "BAT" terminal to charge indicator - gray
8	Cable - generator "F" terminal to regulator "F" terminal cable.	26	Cable - regulator "L" terminal to fuse housing cable - light green
9	Cable - generator "A" terminal to regulator "GEN" terminal	27	Cable - lighting switch to right headlight - violet with white tracer
10	Cranking motor	28	Cable - headlight to headlight - violet
11	Magneto	29	Cable - right headlight to ground - pink
12	Voltage regulator	30	Cable - left headlight to ground - pink with white tracer
13	Generator	31	Cable - lighting switch "TL" terminal to taillight - black
14	Charge indicator	32	Cable - lighting switch "RL" terminal to connector - white
15	Lighting switch		
16	Fuse housing		
17	Magneto ignition switch		
18	Cable - magneto ignition switch to magneto		

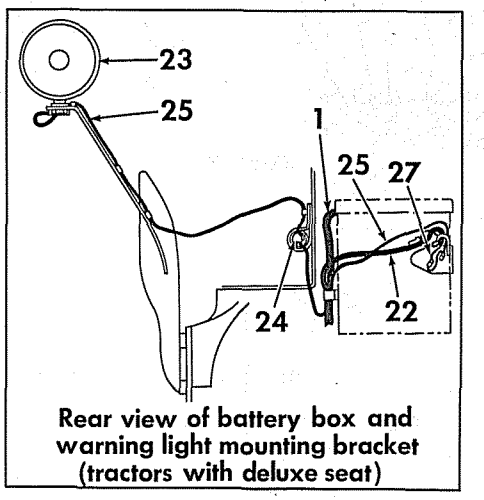












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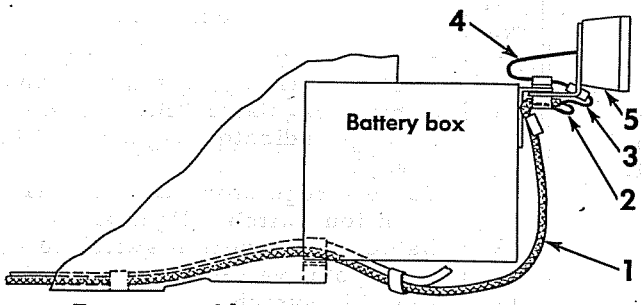
Illust. 36 - Electric starting and warning light wiring diagram for tractors equipped with battery ignition (12-volt electrical system).

Index to reference numbers in Illust. 36

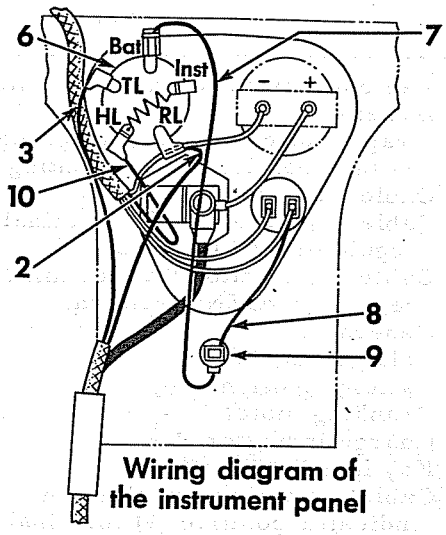
Ref. No.	Description	Ref. No.	Description
1	Cable - battery to starting switch	15	Cable - starting switch to cranking motor
2	Battery	16	Cable - regulator "BAT" terminal to charge indicator negative (-) terminal - gray
3	Strap - battery to ground (ground on battery box left rear mounting bolt)	17	Cable - regulator "L" terminal to key ignition switch - light green
4	Cable harness	18	Cable - key ignition switch to ignition coil positive (+) terminal - black
5	Cable - generator "F" terminal to regulator "F" terminal	19	Lighting switch
6	Cable - generator "A" terminal to regulator "GEN" terminal	20	Fuse housing
7	Generator	21	Cable - fuse housing to lighting switch
8	Voltage regulator	22	Cable - rear light
9	Battery ignition unit	23	Flashing warning light
10	Cranking motor	24	Flasher unit
11	Charge indicator	25	Cable - flashing warning light
12	Key ignition switch	26	Cable - key ignition switch to fuse housing
13	Cable - starting switch to charge indicator positive (+) terminal	27	Cable - flashing warning light to lighting switch - black
14	Starting switch		

Index to reference numbers in Illust. 38.

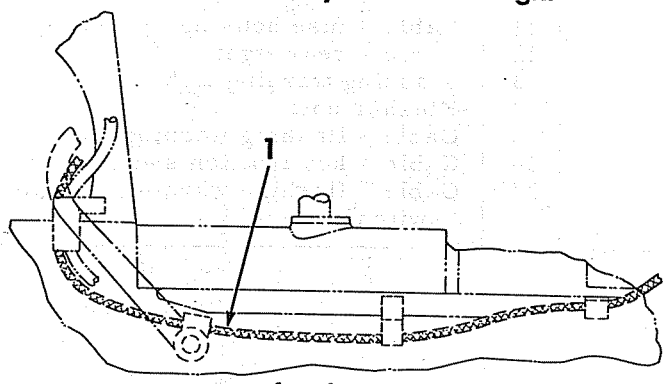
Ref. No.	Description	Ref. No.	Description
1	Cable harness - rear light	9	Fuse housing
2	Cable - lighting switch "RL" terminal to line connector - natural	10	Cable - lighting switch "HL" terminal to right headlight - violet
3	Cable - lighting switch "TL" terminal to line connector - black	11	Headlights
4	Cable - taillight	12	Cable harness
5	Taillight	13	Cable - left headlight to ground - pink with white tracer
6	Lighting switch	14	Cable - right headlight to ground - pink
7	Cable - fuse housing to lighting switch "BAT" terminal	15	Cable - headlight to headlight - violet
8	Cable - fuse housing to ignition switch "IGN" terminal - light green	16	Generator



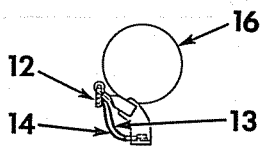
Top view of battery box and taillight



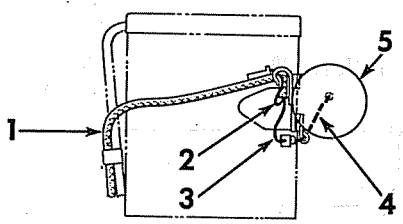
Wiring diagram of the instrument panel



Left side view

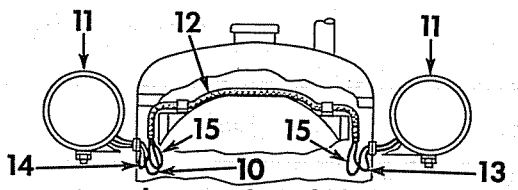


Headlight cables grounded on the generator rear bracket bolt



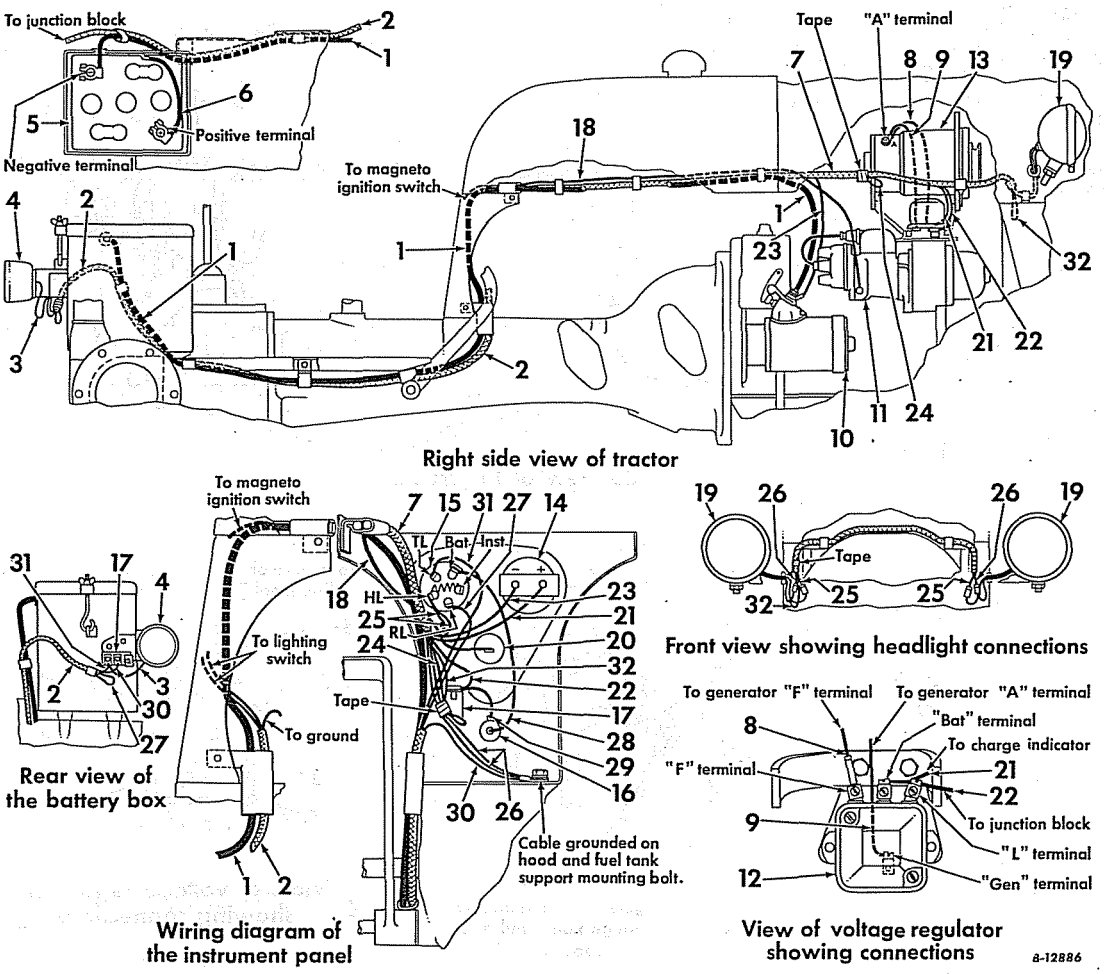
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Rear view of battery box



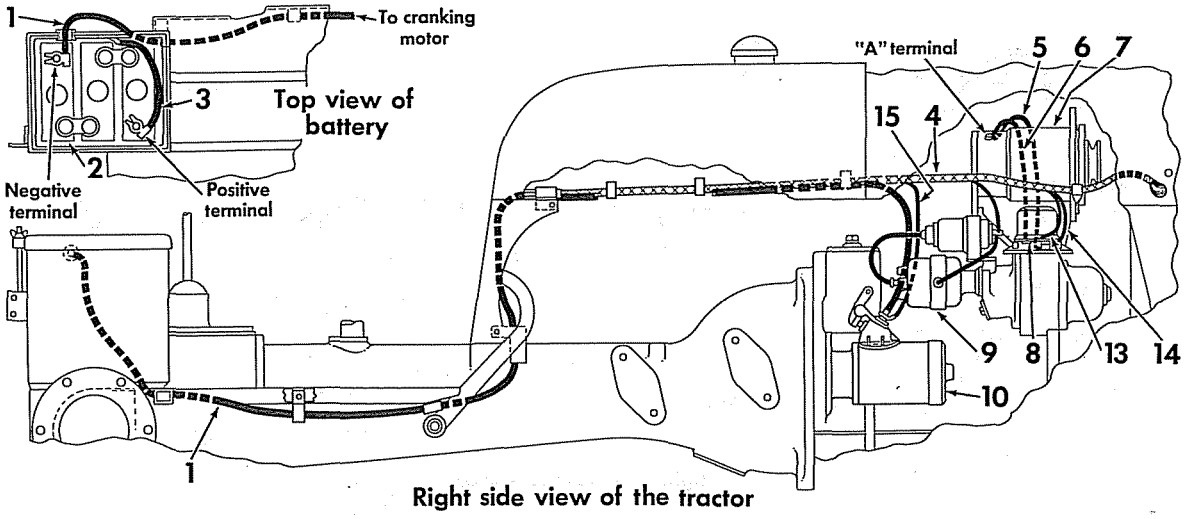
Front view showing headlight connections

Illust. 38
Electric lighting wiring diagram for tractors equipped with battery ignition (12-volt electrical system).

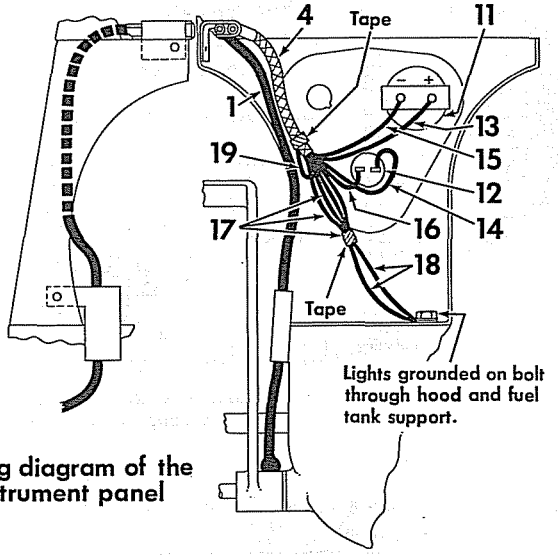


Illust. 39
Electric starting and lighting wiring diagram for tractors equipped with magneto ignitions (6-volt electrical system).

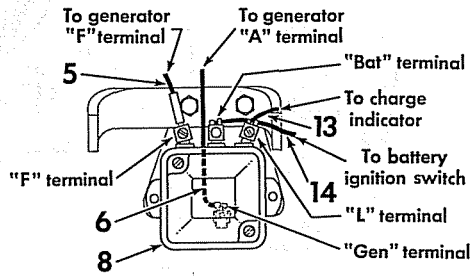
Ref. No.	Description	Ref. No.	Description
1	Cable - battery to starting switch	19	Headlights
2	Cable harness - rear light	20	Magneto ignition switch
3	Cable - taillight to junction block	21	Cable - regulator "BAT" terminal to charge indicator - gray
4	Taillight		
5	Battery	22	Cable - regulator "L" terminal to junction block cable - light green
6	Cable - battery to ground. Ground on bolt through battery box side	23	Cable - starting switch to charge indicator - brown
7	Cable harness		
8	Cable - generator "F" terminal to regulator "F" terminal cable	24	Cable - orange - taped at both ends
9	Cable - generator "A" terminal to regulator "GEN" terminal	25	Cables - lighting switch to headlights - black
10	Cranking motor	26	Cable - headlight to ground - pink
11	Magneto	27	Cable - "RL" terminal to rear light taped at rear light - red
12	Voltage regulator	28	Cable - fuse housing to lighting switch
13	Generator	29	Cable - fuse housing to junction block
14	Charge indicator	30	Cable - junction block to ground - pink
15	Lighting switch	31	Cable - lighting switch to junction block - black
16	Fuse housing		
17	Junction block	32	Cable - dark green taped at both ends
18	Cable magneto ignition switch to magneto		



Right side view of the tractor



Wiring diagram of the instrument panel

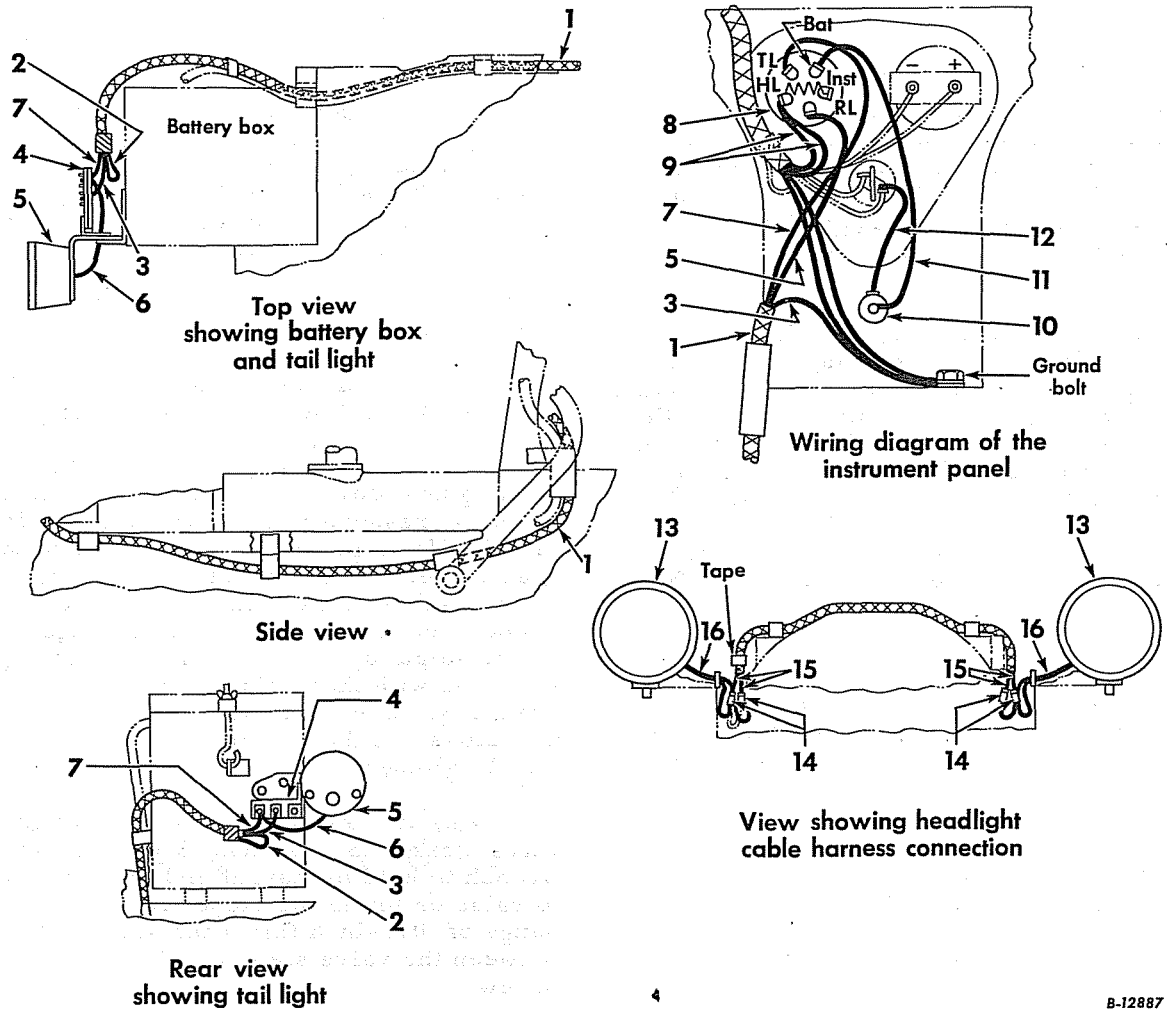


View of voltage regulator showing connections

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Illust. 40
Electric starting wiring diagram for tractors equipped with battery ignition (6-volt electrical system).

Ref. No.	Description	Ref. No.	Description
1	Cable - battery to starting switch	12	Battery ignition switch
2	Battery	13	Cable - regulator "BAT" terminal to charge indicator positive terminal - gray
3	Cable - battery to ground	14	Cable - regulator "L" terminal to battery ignition switch cable - light green
4	Cable harness	15	Cable - starting switch to charge indicator negative terminal - brown
5	Cable - generator "F" terminal to regulator "F" terminal	16	Cable - ignition switch to coil negative terminal - orange
6	Cable - generator "A" terminal to regulator "GEN" terminal	17	Cables - taped
7	Generator	18	Cable - headlight to ground - pink
8	Voltage regulator	19	Cable line connector to horn - taped - dark green
9	Battery ignition unit		
10	Cranking motor		
11	Charge indicator		



Illust. 41
Electric lighting wiring diagram for tractors equipped with battery ignition (6-volt electrical system).

Ref. No.	Description	Ref. No.	Description
1	Cable harness - rear light	10	Fuse housing
2	Cable - "RL" terminal to rear light taped at rear light - red	11	Cable - fuse housing to lighting switch "BAT" terminal - long
3	Cable - junction block to ground bolt - pink	12	Cable - fuse housing to "IGN" switch terminal - short
4	Junction block	13	Headlight
5	Taillight	14	Line connector
6	Cable - taillight to junction block	15	Cables - harness to headlight cable assembly
7	Cable - junction block to lighting switch "TL" terminal - black	16	Headlight cable assembly
8	Lighting switch		
9	Cables - lighting switch "HL" terminal to headlight connectors		

MINOR ENGINE SERVICE OPERATIONS

CYLINDER HEAD GASKET

Check the tightness of the cylinder head bolts after the first 50 hours of engine operation for a new tractor and 50 hours after installing a new cylinder head gasket. The bolts should be tightened to from 45 to 50 foot-pounds torque.

For most satisfactory results in tightening the cylinder head after installing the cylinder head gasket, tighten down all the cylinder head bolts fairly snug, starting with the row in the center, then going to the others. Retighten in the same order, giving each bolt a fraction of a turn at a time. Continue this until all bolts are tight. Do not screw one bolt down perfectly tight and then go on to the next as you will not obtain an even pressure on the gasket in this manner.

After replacing the cylinder head, it is necessary to insure against leaks by retightening the bolts after the engine has been operating and the water jacket has become thoroughly heated.

CRANKSHAFT BEARINGS, PISTONS, AND RINGS

We cannot impress too strongly the necessity of having your International Harvester dealer do the work of replacing the connecting-rod bearings, crankshaft bearings, pistons and rings, and reconditioning the valves.

VALVE CLEARANCE ADJUSTMENT

Check the valve clearance after every 500 hours of operation and adjust the clearance if necessary. A clearance of .015 inch, measured when the valves are closed and the engine is cold, is necessary between the end of the tappet adjusting screw and the valve stems.

When engine valves are equipped with positive-action valve rotators, check the valve clearance after 50 hours of operation, and after every 150 hours thereafter until the clearance remains the same between two checks.

All valves can be adjusted accurately by cranking the engine only twice. Four valves are adjusted when the No. 1 piston is at TDC (compression) and the remaining four valves are adjusted when the No. 4 piston is at TDC (compression).

Adjusting the Clearance

1. To safeguard against accidentally starting the engine when checking the valve clearance, remove cable "B" from the coil cover on the magneto (Illusts. 29 and 29A) or remove distributor-to-coil cable "A" from the socket on the coil of the battery ignition unit. See Illust. 31A.

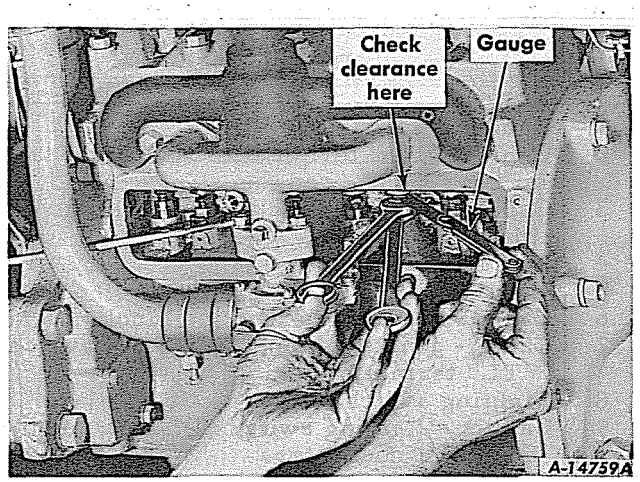
2. Remove the valve cover from the left side of the crankcase.

3. Remove the spark plug from the No. 1 cylinder (the cylinder next to the radiator).

4. Place your thumb over the spark plug opening and slowly crank the engine until an outward pressure is felt. (Pressure indicates that the No. 1 piston is moving toward the top dead center of the compression stroke.) Continue cranking slowly until the top dead center mark (second notch on the back flange of the fan drive pulley at the left side of the engine) is in line with the timing pointer in the front crankcase cover. See Illust. 32. Both valves are now closed on the compression stroke of the No. 1 cylinder.

5. Use two thin wrenches when adjusting the valve clearance. See Illust. 42. Use the lower wrench to hold the tappet and the upper wrench to raise or lower the tappet adjusting screw. A gauge of .015-inch thickness should slip snugly between the valve stem and the tappet adjusting screw.

6. Starting at the front of the engine, adjust valves No. 1, 2, 3, and 5. Then crank the engine one complete revolution and adjust valves No. 4, 6, 7, and 8.



Illust. 42
Adjusting and checking valve clearance.

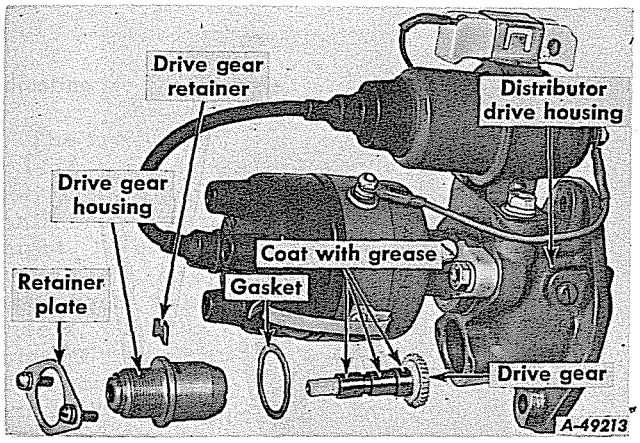
VALVE CLEARANCE ADJUSTMENT - Continued

Adjusting the Clearance - Continued

7. Replace the valve cover. Check to see that the valve cover gasket makes an oiltight seal with the crankcase. Replace the gasket if necessary.

8. Replace magneto cable "B" (Illusts. 29 and 29A) or distributor-to-coil cable "A" (Illust. 31A) into the socket from which it was removed.

Note: Be accurate — use a feeler gauge for checking the valve clearance.



Illust. 43
Battery ignition unit and tachometer drive.

TACHOMETER DRIVE UNIT

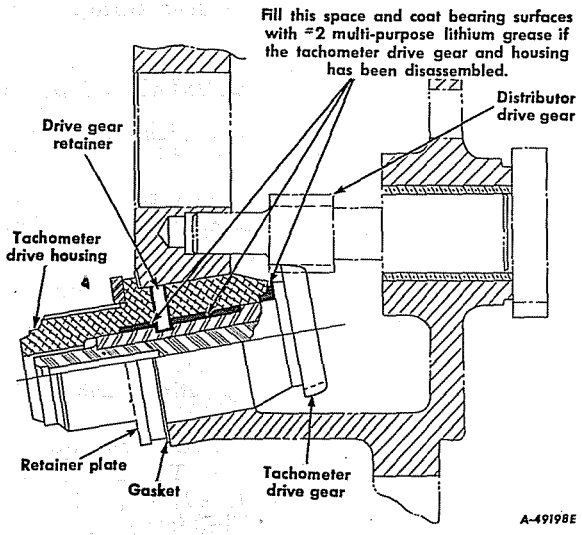
If for any reason the drive gear housing must be removed, proceed as follows:

Remove the two screws and the tachometer drive housing retainer plate. Then remove the housing and drive gear assembly.

If the drive gear housing is disassembled for any reason, inspect the drive gear and replace it with a new one, if necessary. Before reassembly, apply IH Magneto Ball Bearing Grease (359 766 R91) or #2 multi-purpose lithium grease to the space and bearing surfaces shown in Illust. 43A.

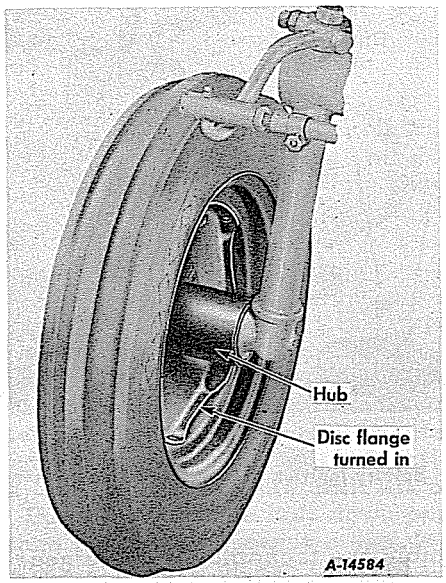
Assemble the tachometer drive gear and housing, complete with the gasket, into the distributor drive housing (Illust. 43). Assemble the retainer plate, screws, and lock washers and tighten them securely.

To prevent failures of the tachometer drive shaft and tachometer drive gear, it is important for the drive shaft to follow a smooth even path from the distributor drive housing to the tachometer. No bend in the shaft should be sharper than a 5-inch radius.

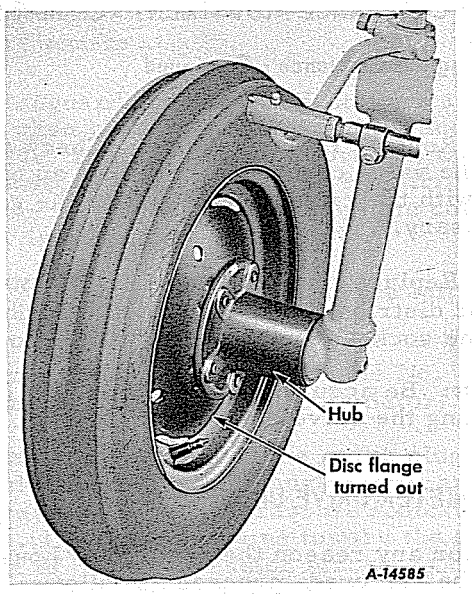


Illust. 43A
Tachometer drive installation diagram.

FRONT WHEELS



Illust. 44
Front wheel with disc flange turned in.



Illust. 44A
Front wheel with disc flange turned out.

The front wheels are steel disc wheels with attached rims for 4.00-12 and 4.00-15, 4-ply tractor-type tires.

The wheels are provided with mounting holes for the addition of cast iron wheel weights.

Each wheel is mounted on the hub with five special bolts and may be mounted with the disc flange turned in or out to obtain different treads.

The hubs rotate on tapered roller bearings. An oil seal and felt washer are used at the inner end of the hubs.

Note: The front wheels must not be mounted with the disc flanges turned out when the tractor is carrying heavy front end weight.

Check the hub bolts for tightness every month or after every 250 hours of operation. Keep them tightened securely.

ADJUSTING THE FRONT WHEEL TREAD WIDTHS

International Cub Tractor

The front wheels can be adjusted to treads of 40-5/8-inches or 46-3/8-inches. The wheels are in the 40-5/8-inch tread position when the disc flanges are turned in. See Illust. 44. To obtain the 46-3/8-inch tread, reverse the wheels on the hubs so that the disc flanges are turned out. See Illust. 44A.

International Cub Lo-Boy Tractor

The front wheels can be adjusted to treads of 43-inches or 49-inches. The wheels are in the 43-inch tread position when the disc flanges are turned in. See Illust. 44. To obtain the 49-inch tread, reverse the wheels on the hubs so that the disc flanges are turned out. See Illust. 44A.

ADJUSTABLE WIDE-TREAD FRONT AXLE

International Cub Tractor

Tractors equipped with an adjustable front axle: The front wheels can be set at treads of 40-5/8, 44-5/8, 52-5/8, and 56-5/8 inches to track with respective rear wheel tread positions.

International Cub Lo-Boy Tractor

Tractors equipped with an adjustable front axle: The front wheels can be set at treads of 39, 43, 47, 51, and 55 inches to track with respective rear wheel tread positions.

ADJUSTABLE WIDE-TREAD FRONT AXLE - Continued

Adjusting the Tread Widths

1. Raise the front end of the tractor.

2. Loosen the bolts holding axle extension clamps "A".

3. Pull the cotter pins and remove axle extension clamp pins "B". Remove the bolts from tie rod clamps "C".

4. Pull the axle extensions out an equal distance on both sides to the desired tread position and move the tie rods to correspond.

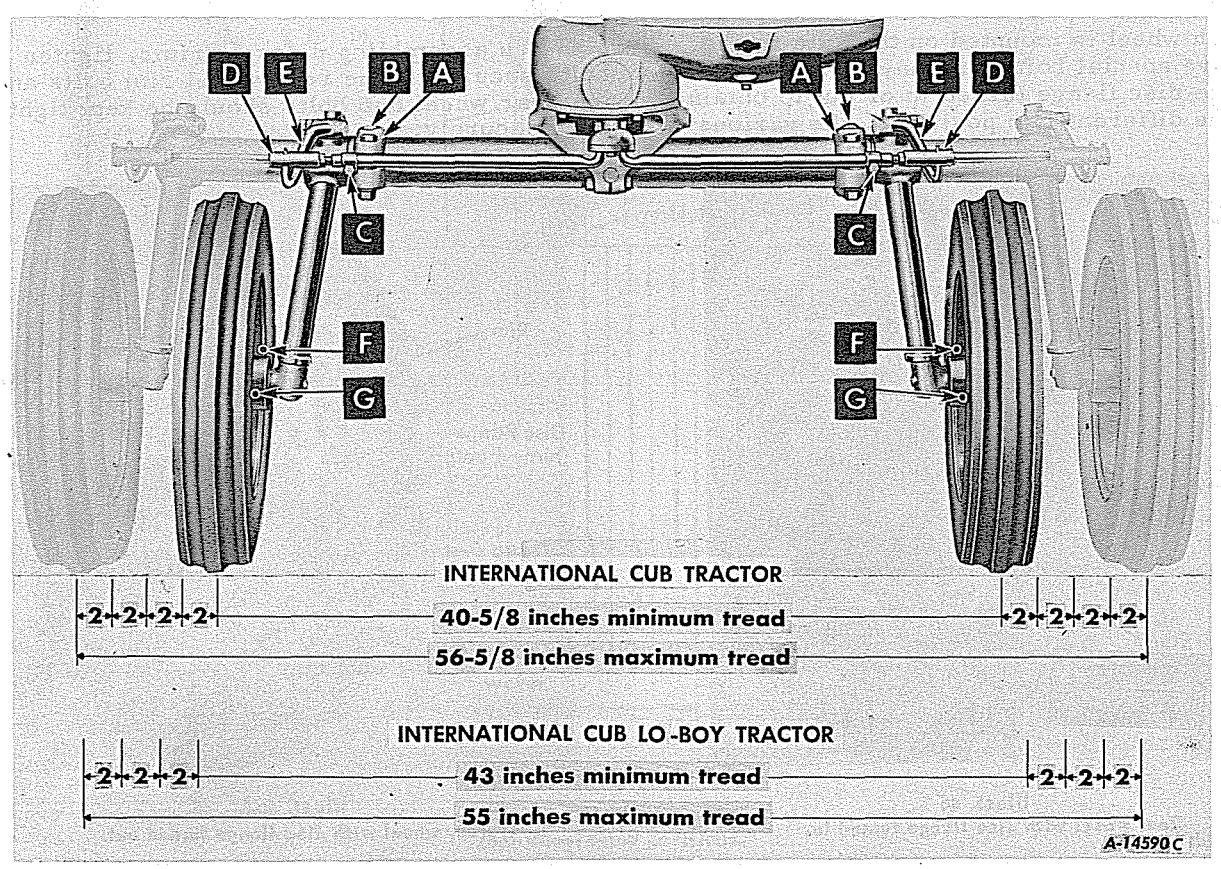
5. Replace axle extension clamp pins "B" in the holes selected and tighten the clamps. Also replace and tighten the bolts in the tie rod clamps.

Adjusting the Toe-in.

The front wheels should have 1/4 inch (± 1/16-inch) toe-in (1/4-inch closer in front than in the rear). To check the toe-in, place chalk marks at point "G" on each rim at hub height, Illust. 45, and measure the distance between them. Move the tractor forward a distance equal to one-half revolution of the front wheels. The chalk marks should now be at point "F". The measurements between points "F" should be 1/4-inch (± 1/16-inch) greater than at "G".

To adjust the "toe-in", disconnect steering knuckle arms "E" at "D". Loosen the lock nuts and turn tie rod ends "D" in or out as required.

Be sure to make the arm adjustments equal.



Illust. 45
Adjustable front axle showing variable wheel treads.

REAR WHEELS

The rear wheels are steel disc wheels with demountable rims for tractor-type agricultural tread tires and are provided with mounting holes for the addition of cast-iron wheel weights.

The following rear wheel rims are available:

Rear wheel rim W5-30 for use with 7.2-30, 4-ply pneumatic tires.

Rear wheel rim W7-24 for use with 8.3-24, 4-ply and 9.5-24, 4-ply pneumatic tires.

The W5-30 and W7-24 rims are furnished with the tractor as ordered.

Each wheel is mounted on the axle flange with five special bolts and may be mounted with the disc flange turned in or out to obtain, with the different rim positions, the various wheel treads described in the following paragraphs.

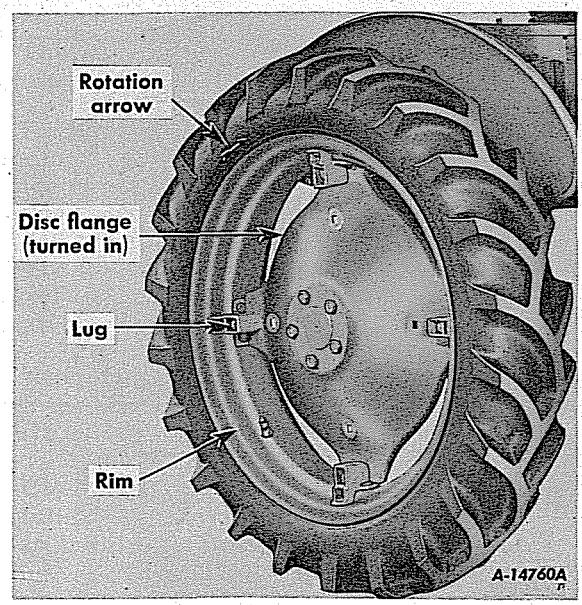
ADJUSTING THE TREAD WIDTHS

The rear wheels can be set in five different tread positions of 40, 44, 48, 52 or 56 inches to suit various crop spacings.

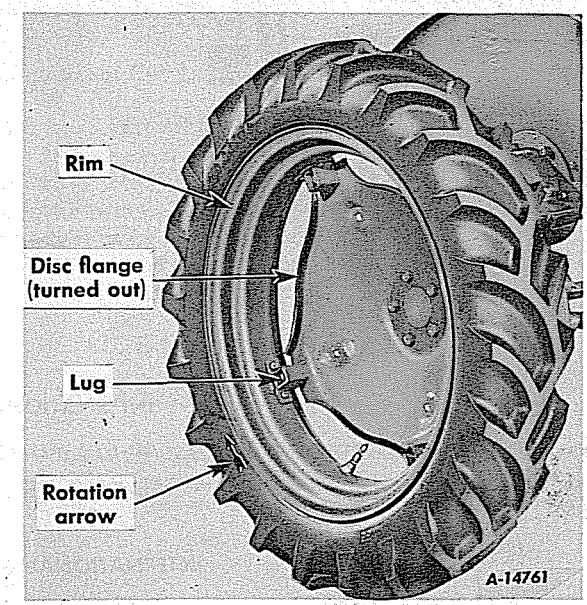
The desired tread position can be obtained by reversing the rear wheel discs and by attaching the rims to the discs in different positions as shown in Illusts. 46, 46A, and 47.

Note: When the rear wheel discs or rims are reversed, make sure that the tire tread will rotate in the correct direction as shown by the arrow on the side of the tires. See Illusts. 46 and 46A.

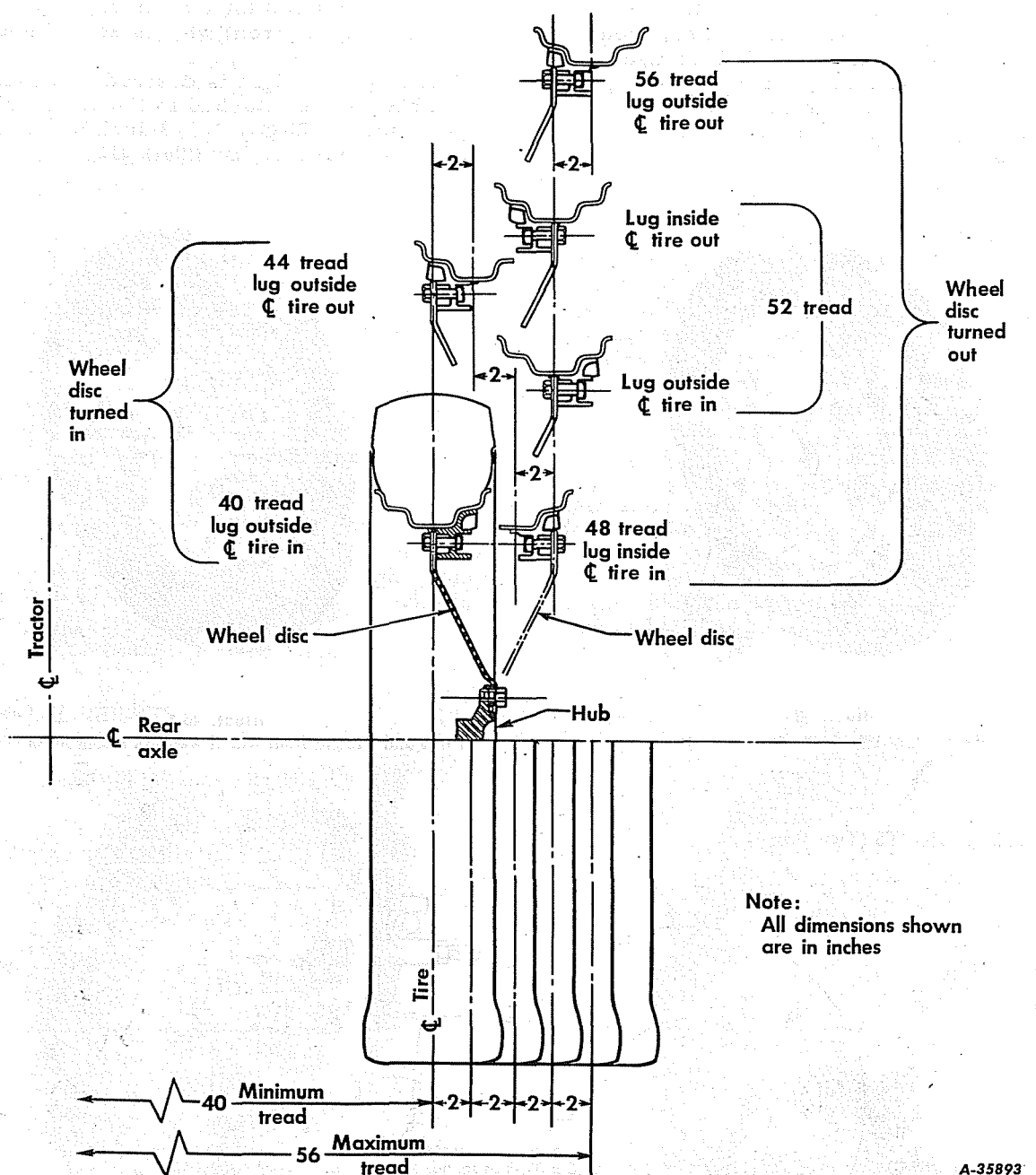
When assembling discs or rims, tighten all bolts securely. The rear wheel rim bolts and the rear wheel hub bolts should be kept tightened securely.



Illust. 46
Rear wheel with disc flange turned in.



Illust. 46A
Rear wheel with disc flange turned out.



Illust. 47
Rear wheel tread positions.

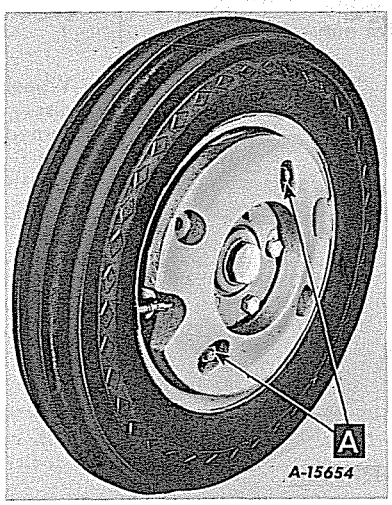
WEIGHTS

FRONT WHEEL WEIGHTS (One-Piece)

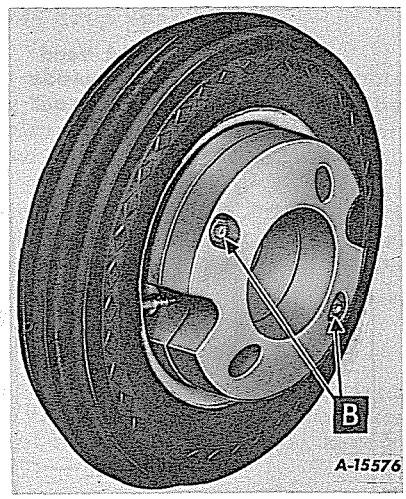
The one-piece front wheel weights weigh approximately 26 pounds each, and either one or two can be attached to the outside of each front wheel. To increase steerability, front wheel weights, are recommended for use as a front end counterbalance whenever heavy loads are superimposed on the drawbar, or when heavy equipment is to be mounted on the rear end of the tractor.

The first set of front wheel weights includes a set of two weights and four 1/2NC x 1-3/4-inch bolts, nuts and lock washers for attaching the weights to the front wheels at "A" (Illust. 48).

If additional weight is desired a second set of weights can be attached to the first weights by using four 1/2NC x 3-3/8-inch bolts, nuts and lock washers at "B" (Illust. 48A).

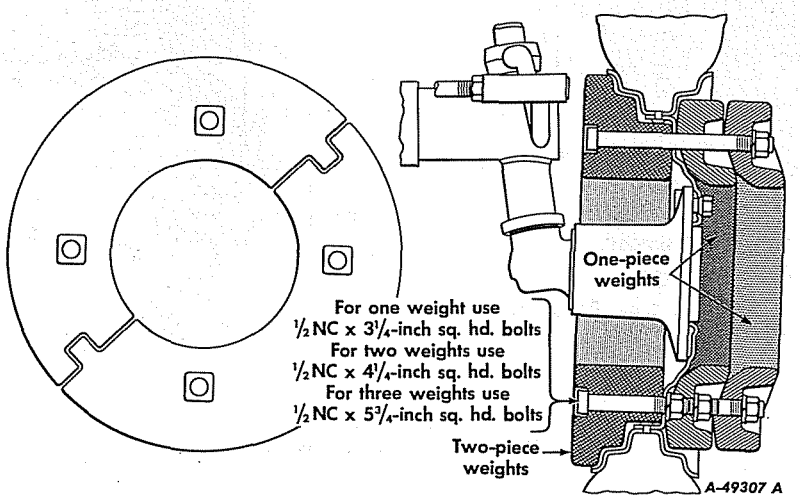


Illust. 48
First front wheel weight mounted on wheel.



Illust. 48A
First and second front wheel weights mounted on wheel.

FRONT WHEEL WEIGHTS (Two-Piece)



Illust. 48B
Two-piece front wheel weights.

FRONT WHEEL WEIGHTS (Two-Piece) - Continued

Two-piece front wheel weights are available to provide additional weight for the front end of the tractor when operating over hilly ground or when a scoop or scraper is being used on the rear of the tractor. These weights are mounted on the inside of each wheel. Each half weighs approximately 25 pounds. A set of these weights can be used either with or without one or two one-piece weights attached on the outside of the wheel. **See Illust. 48B.**

When only a set of two-piece weights is to be attached, use eight 1/2NC x 3-1/4-inch bolts, nuts, and lock washers.

To mount a set of one-piece weights on the outside of the front wheels with two-piece weights on the inside, use eight 1/2NC x 4-1/4-inch bolts, nuts, and lock washers.

If additional weight is desired, a second set of one-piece weights can be added on the outside of the first set of one-piece weights, using eight 1/2NC x 5-3/4-inch bolts, nuts, and lock washers.

The rear wheel weights weigh approximately 150 pounds each and either one or two can be attached to each rear wheel to reduce slippage and tire wear and increase traction of rubber tired tractors.

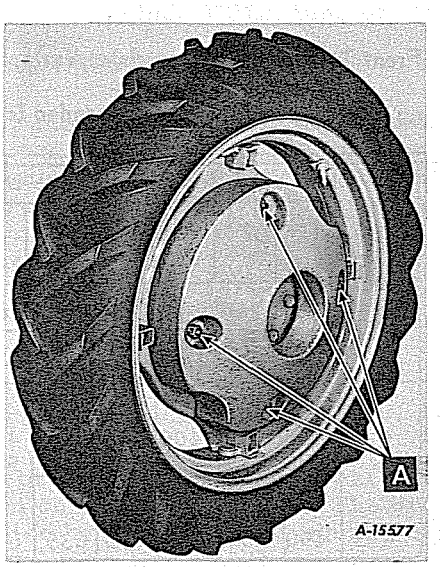
The first set of rear wheel weights includes a set of two weights and eight 1/2NC x 3-inch bolts, nuts and lock washers for attaching the weights to the rear wheels at "A" **(Illust. 49).**

If additional weight is desired a second set of weights can be attached to the first weights by using four 1/2NC x 6-1/4-inch bolts, nuts and lock washers at "B" **(Illust. 49A).**

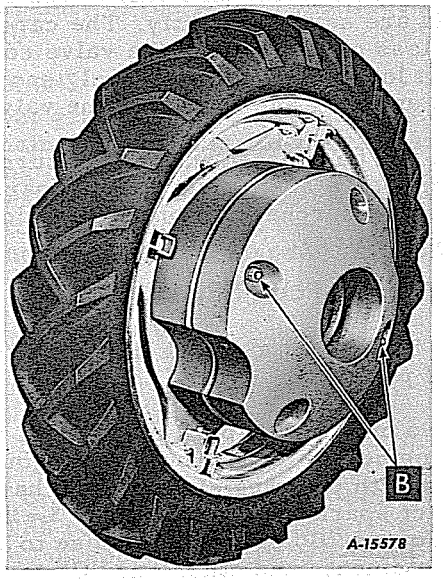
Before attaching the second rear wheel weights, it is necessary to remove two bolts from each first weight and replace them with the longer bolts provided with the second weights.

If the second weights are removed, the two shorter bolts in each first weight previously removed, must be reinstalled.

REAR WHEEL WEIGHTS



Illust. 49
First rear wheel weight mounted on wheel.



Illust. 49A
First and second rear wheel weights mounted on wheel.

PNEUMATIC TIRES

Observe the following instructions and recommendations in order to secure maximum life and efficient service from the pneumatic tires.

CARE OF TIRES

Avoid stumps, stones, deep ruts, and other hazards. Cuts in tires should be repaired immediately, as neglect decreases tire life. Keep the tires free from oil and grease, as both destroy rubber. After using the tractor for spraying (insect control work), use water to remove any chemicals that may be on the tires.

INFLATION

Keep the pneumatic tires properly inflated to the pressures shown in the tables. Underinflation will damage the tire cord body and may cause the tire to slip on the rim and tear out the tube valve stem. Overinflation results in excessive slippage, causing rapid tire wear.

Check the air pressure once a week with an accurate low-pressure gauge having one-pound graduations. Do not allow the air pressure to drop below the recommendations.

Always see that the tire valve caps are in place and are screwed tightly. The caps prevent the loss of air through the valve core, and keeps loose soil, mud, gravel, snow, and ice from entering and damaging the valve core.

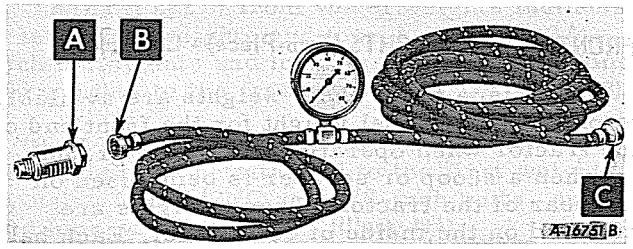
Tires can be inflated with a pressure pump, hand pump, or a spark plug pump. Spark plug pumps can be purchased from International Harvester dealers.

USING THE SPARK PLUG TIRE PUMP

Note: Do not use a diesel engine as the source of power.

Remove one of the spark plugs from the tractor engine, or any carbureted engine, and replace it with pumping element "A" having the correct spark plug thread size. See Illust. 50. Attach one end "B" of the pump hose to the pumping element, and other end "C" to the valve stem of the tire to be inflated.

Start the engine and run it at low speed for maximum efficiency.



Illust. 50
Tire pump, hose, and air gauge.

SHIPPING TRACTORS EQUIPPED WITH PNEUMATIC TIRES

When tractors are transported on a carrier, such as a railroad car or trailer, rear tires should be inflated up to 30 pounds. Front tires to the maximum pressures shown in the table. The higher pressure must be reduced to operating pressure **BEFORE** the tractor is removed from the carrier. Inflation pressure should be as shown in the following tables to make possible rigid blocking and to prevent bouncing.

OPERATING PRESSURE FOR LOW-PRESSURE TRACTOR TIRES

Caution! Upon receiving your tractor, immediately adjust the air pressure in the tires as indicated in the tables.

Front Tire Loads in Pounds at Various Inflation Pressures
Underscoring indicates maximum recommended load per tire.

Tire Size	Ply Rating	Pounds per square inch						
		20	24	28	32	36	40	44
		Kilograms per square centimeter						
		1.40	1.68	1.97	2.25	2.53	2.81	3.09
F-2 Tread								
4.00-12	4	330	365	400	435	465	495	520
4.00-15	4	390	435	475	515	550	585	620
I-1 Tread								
4.00-12	4	450	500	550	595	635	675	

Tire Code Marking	Tire Industry Type
F-2	Agricultural
I-1	Rib Implement

OPERATING PRESSURE FOR LOW-PRESSURE TRACTOR TIRES - Continued

Rear Tire Loads in Pounds at Various Inflation Pressures
Underscoring indicates maximum recommended load per tire.

Tire Size	Ply Rating	Pounds per square inch						
		12	14	16	18	20	22	24
		Kilograms per square centimeter						
		.84	.98	1.12	1.26	1.40	1.54	1.68
R-1 Tread								
8.3-24	4	965	1055	1140	1220	1300	1370	
9.5-24	4	1215	1330	1435	1535			
7.2-30	4	870	950	1030	1100	1170	1230	1300
R-3 Tread								
8.3-24	4	965	1055	1140	1220	1300	1370	
9.5-24	4	1215	1330	1435	1535			

Tire Code Marking	Tire Industry Type
R-1	Agricultural
R-3	Industrial

When equipment is mounted on the tractor, the rear wheel tire loads may be increased up to 20 percent with no increase in inflation (as indicated in the tables and speeds do not exceed 10 miles per hour). Tire loads should be calculated to include FULL bins or tanks.

MOUNTING TIRES ON THE RIM

After mounting a new or old tire on the rim, inflate it to thirty pounds pressure to seat the tire bead on the rim flange and to keep the tire from creeping and shearing off the valve. Then deflate or inflate the tire to the correct operating pressure.

TRACTION AND WEIGHTS

The tractor should not be operated with the tires improperly inflated. To insure the maximum hours of service, watch the tread lugs; if they wear down too fast, immediately add more weight to cut down slippage. Check for high air pressure. Consult your International Harvester dealer for information.

WHEEL WEIGHTS

The drawbar pull of a tractor can be increased by adding cast iron weights to the driving wheels, and by the use of liquid in the tire tubes.

The amount of the increase in drawbar pull by the addition of certain definite weights varies with the type of soil. When very heavy weight is required, both liquid and cast iron weights can be used.

After adding weight to the rear wheels, it may be necessary to readjust the height of the drawbar to obtain the correct alignment.

OVERLOADING

Do not overload the tractor tires by mounting implements on the tractor which exceed the load capacity of the size of the tires on the tractor.

TIRE CHAINS

In wet grass or ground conditions, use lug-type chains. The flexing of the tire and the creeping of chains will break the mud loose as the wheel rotates. **Note:** There is a possibility of the tire slipping within the chain; to prevent this, the use of spring-type chain fasteners is recommended.

BRAKES

The brakes consist of external bands that contract on the brake drums. The brakes are controlled by foot pedals which can be operated individually or simultaneously when locked together.

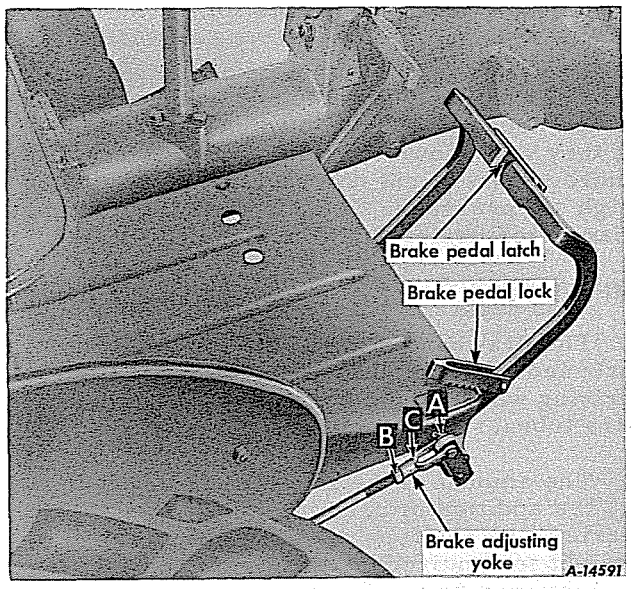
Check the brakes for free movement and equal pressure after every 150 hours of operation until the proper interval is determined according to usage. Gheck the free movement thereafter as required to maintain equal pressure and efficient braking.

The brakes should not drag before they take hold. The pedals should have a free movement, by hand, of approximately 7/8-inch.

BRAKE ADJUSTMENT

To adjust the brakes, jack up the rear end of the tractor. Remove pin "A" and loosen lock nut "B". See Illust. 52. Turn adjusting yoke "C" until each wheel drags slightly when turned.

BRAKE ADJUSTMENT - Continued



Illust. 52
Brake pedal adjustments.

Replace pin "A" and tighten lock nut "B" after the adjustment has been completed.

It is very important to have the brakes equalized. To have equalized brakes, both pedals must have the same amount of free movement.

To check the equalization of the brakes, jack up both rear wheels so they will turn freely, block the tractor securely and latch the brake pedals together; then start the engine. Shift the gears to either third or fourth speed and engage the clutch; while the wheels are turning, apply the brakes.

Application of the brakes should slow down both wheels at the same time and also reduces the speed of the engine.

If one wheel stops and the other wheel continues to revolve when the brakes are applied, loosen the adjustment on the wheel that stops just enough so both wheels stop simultaneously when the brakes are applied.

CLUTCH

The engine is equipped with a spring-loaded, 6-1/2-inch diameter, single plate, dry disc clutch.

As a result of normal clutch facing wear, the free travel between the clutch release levers and the release bearing is reduced. Lack of clearance causes overheating of the clutch, loss of power, and early replacement of clutch facing.

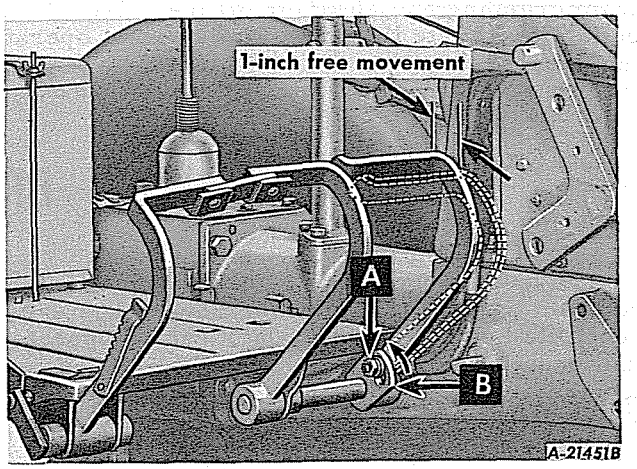
Check the clutch for free movement after every 150 hours of operation until the proper inspection interval is determined according to usage. Check the free movement thereafter, as required, to provide proper clearance between the clutch release bearing and the clutch release levers.

CARE OF THE ENGINE CLUTCH

The engine clutch is designed so that it requires a minimum of attention. It is important however, that a clearance of approximately 1/8-inch be maintained between the engine clutch release bearing and the engine clutch release levers. Also, the clutch release shaft and release bearing should be lubricated at proper intervals as instructed in the "Lubrication Guide".

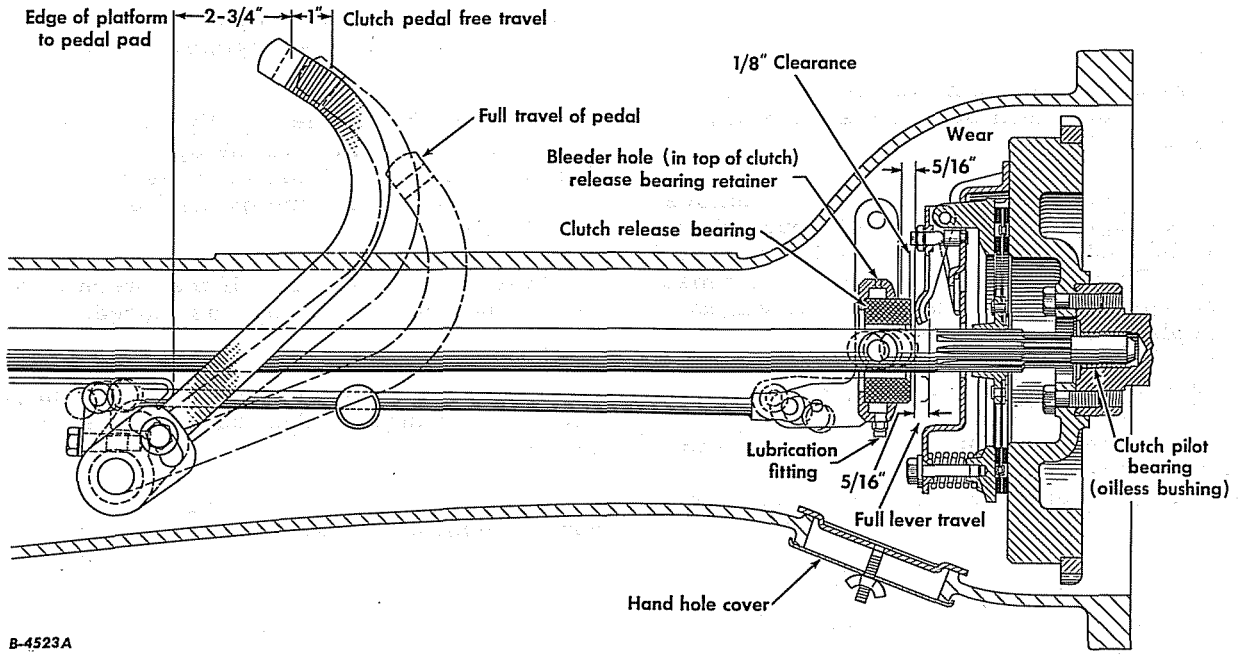
ADJUSTING THE ENGINE CLUTCH

The correct free travel can be maintained by loosening cap screw "A" (Illust. 52A) on the outside of the clutch pedal, and rotating the slotted lever at "B" counterclockwise to a position which will give the 1-inch free pedal travel; then retighten the cap screw.



Illust. 52A
Clutch pedal adjustment.

ADJUSTING THE ENGINE CLUTCH - Continued



Illust. 53
Clutch adjustments.

STORING THE TRACTOR

When your tractor is not to be used for some time, it should be stored in a dry and protected place. Leaving your tractor outdoors, exposed to the elements, will result in materially shortening its life.

Follow the procedure outlined below when your tractor is placed in storage, and repeat steps 1, 5, and 8 every six months thereafter. We also recommend that caution be practiced in starting an engine that has been in storage.

1. Wash or clean and completely lubricate the tractor. See the "Lubrication Guide".

2. Store the tractor so the tires are protected from light. Before storing the tractor, clean the tires thoroughly. Jack up the tractor so that the load is off the tires when it is to be out of service for a long period. If it is not jacked up, inflate the tires at regular intervals.

3. Run the engine long enough to thoroughly warm the oil in the crankcase. Then drain the oil. Remove the oil filter element. (If any evidence of rust is found on the retaining bolt, clean it thoroughly.) Replace the old filter element with a new one and flush out any sludge from the filter base. Refill the crankcase with fresh oil and run the engine from two to five minutes.

STORING THE TRACTOR

Note: Gum will eventually form in the fuel tanks, lines, and carburetor if the unit is not used. Gum in carburetor jets and passages affects engine starting. Gum can be dissolved with commercial carburetor cleaner.

4. Drain the fuel from the fuel tank and carburetor, and clean out the fuel strainer glass bowl.

5. After the engine has cooled off, remove the spark plugs and pour one tablespoonful of SAE-50 lubricating oil of good quality into each cylinder. Crank the engine two or three times to distribute the oil over the cylinder walls. Then replace the spark plugs.

6. Drain and flush the cooling system.

7. **Tractors with Magneto:** Oil the magneto impulse coupling liberally with very light oil, such as cream separator or sewing machine oil.

8. Remove the valve cover and slush the valves, rocker arms, and push rods with SAE-50 oil. (If any evidence of rust is found, remove it before lubricating.) Use a paint brush to coat the inside of the valve cover with SAE-50 lubricating oil. Replace the valve cover.

9. Remove the oil filler breather cap and oil level gauge. Then plug the oil filler pipe. Also plug the exhaust pipe.

10. Remove the battery and place it on a rack or bench in a cool, dry place above freezing (+32° F.). Check the battery at least once a month for water level and specific gravity.

11. Block the clutch pedal with a wood block so that the clutch is disengaged. This will prevent the clutch facing from sticking to the flywheel or clutch pressure plate.

REMOVING FROM STORAGE

1. Remove the plugs from the crankcase breather cap, the breather pipe and the exhaust pipe.

2. Install a fully charged battery and be sure the proper connections are made. **See Illust. 25A.**

3. Remove the valve cover and slush the valve and valve operating mechanism with a mixture of one-half kerosene and one-half SAE-10W engine oil.

4. Remove the spark plugs and pour a mixture of one-half gasoline and one-half light lubricating oil into each cylinder; one ounce (two tablespoonfuls) per cylinder is enough.

5. Crank the engine rapidly until excess oil has been blown out of the spark plug holes. This operation will loosen any tight piston rings and wash old, gummy oil from the valves and pistons.

Omit steps 6, 7, and 8 if they were performed before the tractor was stored.

6. Drain the crankcase and flush it out with kerosene or flushing oil and fill with specified lubricating oil. See the "Lubrication Guide".

7. Be sure the lubricating oil filter has a new element before starting the engine.

8. Clean the air cleaner and refill the oil cup.

9. Install the spark plugs after cleaning and setting the gaps.

10. Fill the cooling system. Be sure the cooling system has a rust inhibitor added to it.

11. Fill the fuel tanks.

Caution! Do not accelerate the engine rapidly, or operate it at high speed immediately after starting. Also keep the doors wide open or move the machine outside the storage room immediately to avoid danger from exhaust gas.

12. Start the engine and let it run slowly. If a valve is sticking, pour a small quantity of kerosene on the valve stem until it is loose.

13. Assemble the valve cover.

14. After the engine has been run long enough to clean the excess oil out of the cylinders, the spark plugs should be removed and checked for oil fouling. If fouled, clean and reinstall them in the engine.

15. Remove the block from the clutch pedal.

16. Before driving the tractor, inflate the tires to the correct operating pressures.

COLD WEATHER PRECAUTIONS

When operating the tractor in temperatures of +32 degrees F. or lower, observe the following precautions:

FUEL SYSTEM

Use only a high-test, winter-grade gasoline for starting, and keep your supply in a closed container so the more volatile portion does not evaporate.

Fill the fuel tank at the end of the day's run to prevent condensation in the tank.

LUBRICATION

Be sure to use lubricant of the correct viscosity in the engine crankcase as specified in the "Lubrication Table".

MAGNETO IMPULSE COUPLING (Tractors with Magneto)

For satisfactory starting, it is important to keep the magneto impulse coupling oiled liberally. The impulse coupling should be kept free of dirt and gummy rust formation.

When the engine is hand-cracked, the impulse coupling should trip (click) twice for each revolution of the engine. Failure to do so may indicate the need for cleaning. Refer to pages 27 to 30 for further information.

COOLING SYSTEM

When the temperature is likely to be +32 degrees F. or lower, there is danger of the water freezing in the cooling system.

To prevent this, drain the water from the cooling system at the end of each run or use IH permanent type antifreeze.

Draining and Refilling the Cooling System

If an antifreeze is not to be used:

1. Remove the radiator drain plug on the bottom (center) of the radiator.

2. See that the drain is not clogged and that the water drains completely. Then replace the radiator drain plug.

Note: Before filling the cooling system in freezing weather, cover the front of the radiator. Have sufficient water available at the tractor to fill the cooling system (warm water is preferable). Start the engine, then put the water in **immediately.** This keeps the water from freezing during warm-up. Maintain the operating temperature of the engine by uncovering as much as necessary of the front of the radiator.

If an antifreeze is to be used:

1. Inspect the hose connections. They must be in good condition both inside and out. Then tighten all water connections.

2. Inspect the fan belt and adjust it, if necessary, to the proper tension. If the belt is worn, or oil-soaked, install a new one.

3. Drain the cooling system as described above. Clean it as described on page 22.

4. Check to be sure that the radiator drain plug is tightly closed. Then fill the cooling system, using either of the following procedures:

a. Make a solution of the required amount of IH permanent type antifreeze with the necessary amount of clean water (use soft or rain water if possible) to fill the cooling system. Fill the cooling system to a level slightly below the bottom of the radiator filler neck, when equipped with a nonpressure-type radiator cap; or to a level approximately 2-inches below the top of the filler neck, when equipped with a pressure-type radiator cap.

b. Put the required amount of antifreeze into the cooling system. Fill the cooling system with clean water (use soft or rain water if possible) to a level slightly below the bottom of the filler neck, when equipped with a nonpressure-type radiator cap; or to a level approximately 2-inches below the top of the filler neck, when equipped with a pressure-type radiator cap. Start the engine and run it until operating temperature is reached, to allow the antifreeze and water to mix thoroughly.

5. Check the cooling system for leaks, paying special attention to the hose connections.

Antifreeze Solutions

The use of alcohol as an antifreeze is not recommended because methanol boils at +148 degrees F. However, if it is necessary to use alcohol, check the solution frequently to make certain you have adequate protection for the prevailing temperature.

Note: Use only one type of antifreeze solution. Do not mix solutions, as it will be difficult to determine the exact amount of protection.

Never use any of the following in the cooling water as an antifreeze - honey, salt, kerosene, fuel oil, glucose or sugar, calcium chloride, or any alkaline solution.

TROUBLE SHOOTING

Mechanical Problems and their Probable Cause

If any trouble is experienced, make sure of the cause before attempting to make any adjustments. When making an adjustment, keep in mind the previous setting in case the adjustment doesn't solve the problem.

Possible Cause	Possible Remedy
HARD TO START	
No gasoline in starting tank or carburetor	Fill the tank with gasoline; open the fuel shut-off valve. Check the fuel lines, fuel strainer and carburetor.
Fuel strainer or fuel lines clogged	Clean the fuel strainer, check the fuel lines and carburetor.
Impulse coupling inoperative (tractors with magneto)	Flush with kerosene; see page 28.
Water in gasoline	Drain the fuel tank and carburetor. Use new fuel and dry the spark plugs. *
Water in cylinders	Check the cylinder head gasket or look for a clogged drain hole in the exhaust manifold or muffler.
Choked improperly. Flooded engine	Follow the starting instructions. See pages 9 and 10.
Defective ignition or loose wiring	Check the wiring, plugs, distributor and coil unit, or magneto, etc. See pages 25 to 41.
Defective battery or cranking motor	Check and service; see pages 33 and 34 or replace.
Spark plugs dirty or improper gap	Clean, adjust the gaps to .023 inch, or replace the plugs.
Magneto grounded (tractors with magneto)	Pull out on the ignition switch. Check for other possible grounds; also see "Magneto" on pages 27 to 30.
Engine speed control not advanced	Advance the lever one-third for starting.
Lack of compression	*
Flywheel ring gear teeth broken	*
Lubricating oil of too high viscosity	Drain and refill with proper lubricant. See the "Lubrication Table" on page 65.
Gears engaged	Put the gearshift in the neutral position.
Internal seizure	*
ENGINE OPERATES IRREGULARLY OR KNOCKS	
Engine incorrectly timed	Retime.
Spark plugs dirty; wrong gap or wrong type	Clean, reset the gaps to .023 inch, or replace.
Poor or weak spark	Check the distributor and coil unit or magneto to see if the spark is good from the coil. Check the breaker points and breaker point opening, spark plugs, and wiring; see pages 25 to 41.
Carburetor setting incorrect	Adjust; see "Carburetor" on page 11.
Poor grade fuel or water in fuel	Drain and use a good grade of clean fuel.
Engine overheating	Check the cooling system and fan belt; adjust the radiator shutter if used; see "Engine Overheats" on page 57.
Engine valves at fault	Check the valve clearance. *
Air leaks around intake manifold	Check the gasket and tighten the nuts.
Engine smokes	Check the air cleaner oil level. Check the fuel delivery at the carburetor. Check for worn piston and rings. *
Excessive carbon in engine	*
Loose piston pin or bearings	*
Broken rings or loose pistons	*
Worn connecting rod and main bearings	*
Governor sticking or needs adjustment	*

*** See your International Harvester dealer.**

TROUBLE SHOOTING

Possible Cause	Possible Remedy
LACK OF POWER	
Engine speed control lever not advanced	Advance the engine speed control lever.
Engine cold or overheated	Run the engine until it warms up before putting it under load. Check the cooling system. *
Engine overloaded	Reduce the load.
Engine knocks excessively	Use good fuel; also check the timing. *
Governor not working properly	*
Poor compression	Service the valves and piston rings. *
Poor fuel or too lean a mixture	See "Carburetor" on page 11.
Fuel lines or strainer obstructed	Clean; see page 10.
Fuel tank air vent closed	Open the vent in the cap.
Exhaust pipe clogged	Clean out.
Air cleaner clogged or air leakage between carburetor and engine	Clean the air cleaner as instructed on pages 24 and 25. Tighten the carburetor and manifold mounting nuts.
Oil of too high viscosity in crankcase or air cleaner	Drain and refill with proper lubricant. See the "Lubrication Table" on page 65.
Incorrect timing or faulty ignition	See "Distributor and Coil Unit" on pages 30 and 31 or "Magneto" on pages 27 to 41.
Clutch slipping	Adjust the free travel of the pedal; see pages 52 and 53.
Brakes drag	Adjust the brakes; see pages 50 and 51.
Carburetor intake manifold or cylinder head intake ports restricted by carbon	Clean. *
ENGINE OVERHEATS	
Cooling system clogged or limed	Clean the system; see page 22.
Fan belt slipping	Adjust or replace the belt; see page 23.
Insufficient water in cooling system	Fill the radiator to the proper level; see page 21.
Radiator cores clogged	Remove all chaff or dirt from the radiator grille; clean with forced air or water.
Wrong kind of fuel	Change to a good grade of gasoline.
Carburetor improperly set	See "Carburetor" on page 11.
Timing incorrect	Check "Distributor and Coil Unit" on pages 30 and 31 or "Magneto" on pages 27 to 30.
Breaker point opening incorrect	Adjust the opening; see "Distributor and Coil Unit" or "Magneto" on pages 27 to 31.
Excess load	Reduce the load.
Excess carbon in engine	*
Heat indicator defective (distillate engine)	Replace the heat indicator. *
NO OIL PRESSURE, TOO HIGH OR TOO LOW	
Defective oil pressure indicator	Replace. *
Wrong viscosity, diluted or insufficient oil	See the "Lubrication Table" on page 65. Check the oil level; if diluted, replace with fresh oil.
Broken, loose or plugged oil lines	Clean and tighten. *
Low oil level in crankcase	Add oil; see the "Lubrication Guide." Check for an oil leak.
Defective or dirty oil pressure regulating valve	*
Oil pump strainer clogged or pump not working	Clean as instructed on pages 62 to 64.
Worn bearings	*

* See your International Harvester dealer.

TROUBLE SHOOTING

Possible Cause	Possible Remedy
OIL DILUTION OR USES TOO MUCH OIL	
Oil of incorrect viscosity	See the "Lubrication Table" on page 65.
Leaks in oil lines or filter or in oil pan plug or gasket	Check and tighten. *
Worn piston or oil rings	*
Loose connecting rod bearings	*
Long engine idling	Stop the engine.
Engine overheating or too cold	See "Lack of Power" and "Engine Overheats"; see page 57.
Engine speed too high	*
Crankcase breather clogged	Clean. See page 61.
USING TOO MUCH FUEL	
Fuel mixture too rich. Carburetor out of adjustment	Check choke and see "Carburetor" on page 11.
Fuel leaks	Tighten or replace the fuel lines or fuel strainer gasket.
Poor grade of fuel	Use a good grade of gasoline.
Choke closed	Investigate for the choke not operating.
Engine overloaded	Reduce the load or shift to a lower speed.
Poor compression	*
Faulty ignition	*
Engine not operating at proper temperature	Check the cooling system. Check the lubricating oil. *
Air cleaner clogged	Service the air cleaner; see pages 24 and 25.
Wrong viscosity or amount of lubricating oil	See the "Lubrication Table" on page 65 and keep the oil up to the proper level.
NO FUEL AT CARBURETOR	
Fuel low in tank	Fill the fuel tank and check the fuel lines.
Air vent hole in fuel tank cap plugged up	Clean out the vent hole.
Fuel valve closed or partly open	Open the valve; see the starting instructions.
Dirty or clogged fuel strainer screen or line	Clean as instructed on page 10.
IGNITION AND ELECTRICAL	
Wrong kind, old, cracked, dirty, or poorly set spark plugs	Clean and set the gaps to .023 inch, or replace with new plugs.
Loose wiring or improper connections	Check the wiring to see that all connections are clean and tight; see pages 35 to 41.
Distributor and coil unit or magneto not timed correctly	Retime as instructed on pages 27 to 31.
Distributor cap or rotor or breaker chamber dirty	Clean as instructed on pages 30 and 31.
Breaker points dirty, pitted or improperly set	Clean and reset the opening or replace with new points; on pages 30 and 31.
Breaker arm stuck, weak or broken spring	Check and replace; see pages 30 and 31.
Impulse coupling dirty (tractors with magneto)	Clean and lubricate as instructed on page 28.

*See your International Harvester dealer.

TROUBLE SHOOTING

Possible Cause	Possible Remedy

IGNITION AND ELECTRICAL - Continued

Battery defective, low charge or loose connections	Recharge, clean and tighten the cable lugs or replace with new; check the ground cable; see pages 33 and 34.
Cranking motor failure	Replace. *
Generator inoperative	Clean the commutator, check the brushes; see page 32.
Voltage regulator or generator relay	*
Charge indicator inoperative	Replace the charge indicator. *
Charge indicator shows discharge	Check the battery and generator; check the drive belts and wiring.
Lights will not burn	Check the battery ground cable. Turn on the switch, replace the sealed beam units, replace the fuse, recharge the battery, or check the wiring and generator. *
Lights burn dim	Turn the switch to bright. Recharge the battery, tighten the cable terminals, check the sealed beam units, clean the contacts.

BRAKES

Do not hold	Adjust the brakes; see pages 51 and 52 for new lining needed. *
Drag or uneven	Adjust the brakes; see pages 51 and 52.
Grease on lining	Replace the lining. *
Return spring broken	Replace.
Do not release	Release the brake lock. Be sure the left brake cross shaft is free to turn.

TRANSMISSION, BELT PULLEY AND POWER TAKE-OFF

Hard to shift gears	Use lubricant of the correct viscosity; see page 65.
Shifter fork or lever defective	Replace. *
Engine clutch drags	See "Lack of Power."
Gears clashing	Stop the tractor and disengage the clutch before shifting the gears.
Gears slipping out of mesh	*
Noisy	Check the oil level; use lubricant of the proper viscosity. *
Damaged parts	*

REAR WHEELS

Do not turn	Release the brake lock. Transmission, differential or clutch faulty. See the transmission section above. *

FRONT WHEELS

Too tight or too loose	Check the lubricant in the bearings, check the bearing adjustment; see page 64.
Lubricant leakage	Check the oil seal. *

* See your International Harvester dealer.

TROUBLE SHOOTING

Possible Cause	Possible Remedy
STEERING	
Faulty	Check the steering worm and gear; check the front axle adjustment; see pages 44 and 45. Check the lubricant in the front wheel. Check the tire inflation. *
Defective front axle	Inspect the linkage, check and replace faulty parts. *
Tractor turns to one side	Check and adjust the brakes evenly; see pages 51 and 52. Check the pneumatic tire air pressures. Check the front axle adjustment; see pages 44 and 45.
PNEUMATIC TIRES	
Excessive or uneven wear	Check for toe-in; see page 45. Check the air pressure and load on the tires.
Slippage, rear tire	Add more weight, and check for high air pressure; see pages 50 and 51. If the tread is badly worn, the tires may slip more readily. Replace with new tires or use lug-type chains.
FARMALL TOUCH-CONTROL SYSTEM	
Maintenance	See detailed instructions on pages 13 and 14.

* See your International Harvester dealer.

LUBRICATION

The life of any tractor depends upon the care it is given. Proper lubrication is a very important part of that care.

Tractors shipped to destinations in United States of America, Canada, and Mexico, have the engine crankcase filled with oil. Refer to "Engine Oil", the "Lubrication Guide", and the "Lubrication Table" for proper oil and service information.

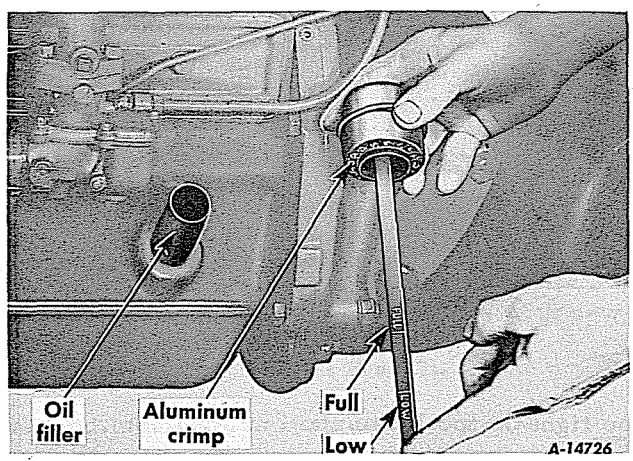
Gasoline engines have the crankcase filled with shipaway oil. This oil may be used for the first 100 hours of engine operation at prevailing ambient temperatures from ten degrees below zero to ninety degrees above zero Fahrenheit. **Note:** This oil is not to be diluted with kerosene for cold weather operation.

The engine has a pressure-feed lubrication system. A gear-type oil pump circulates the lubricating oil under pressure to the crankshaft bearings, connecting rod bearings, camshaft bearings, valve mechanism, and timing gears thereby assuring positive lubrication of all parts.

The oil pressure gauge indicates whether lubricating oil is circulating through the engine. Refer to page 6 for further information.

The engine is equipped with an oil filter which continually cleans the oil while the engine is running. To obtain the full benefit from the filter, replace the used element with a new one, every second time the oil in the crankcase is changed. (After every 200 hours of operation). Cleaning the oil element is not satisfactory.

CRANKCASE BREATHER AND OIL FILLER CAP



Illust. 60
Checking the oil level in the crankcase.

CRANKCASE BREATHER AND OIL FILLER CAP – Continued

The crankcase oil filler cap has a bayonet-type oil level gauge attached to it. The oil level should never be above the "FULL" mark or below the "LOW" mark on the gauge. When checking the oil level (Illust. 60), the gauge must be withdrawn and wiped clean, then inserted all the way and withdrawn for a true reading.

Never check the oil level while the engine is running.

OIL PUMP

The gear-type oil pump in the crankcase has a screen attached to the oil intake which stops large dirt particles from entering the oiling system. Clean this screen whenever the oil pan is removed.

ENGINE OIL

Types of engine oil marketed have been classified by the American Petroleum Institute (API) as "For Service ML," MM, MS, DG, DM and DS.

It is not the policy of the International Harvester Company to publish approved lists of lubricants or to guarantee oil performance in service. The responsibility for the quality of the lubricant, its performance under the conditions of operation, and its compatibility with the diesel fuels used must remain with the supplier of the lubricant.

New API Service classifications are now in effect. Engine oils under the new code are designated SA, SB, SC, SD, SE, CA, CB, CC and CD. In this code, prefix "S" denotes oils available in service stations. Prefix "C" denotes oils available for commercial users, contractors, farmers, etc. The second letter indicates quality of oil, "A" being lowest and "E" highest.

We recommend "I. H. Low Ash Engine Oil" for the gasoline engine. This oil is specifically formulated to minimize spark plug fouling and exhaust valve failures, and provide maximum engine life.

If other than "I. H. Low Ash Engine Oil" is used, it must be designated "For Service MS" and as a qualified "MIL-L-2104B". In new API code, these oils are usually designated as meeting both SD and CC requirements. For maximum engine life, these oils must contain a minimum of barium, calcium, or magnesium additives and should contain less than 0.5% sulfated ash.

Multi-viscosity numbered oils such as SAE 10W-30 or SAE 10W-40 must not be used above 32 degrees Fahrenheit.

TO AID STARTING

To facilitate starting, the selection of crankcase lubricating oils should be based on the lowest anticipated temperature for the day. It is not necessary to change the crankcase oil every time the temperature rises or falls into another temperature range during some part of the 24-hour day.

Note: After changing oil, the engine must not be operated at high speed or under load until the new oil has had ample time to reach all bearings.

After changing to a lighter grade of oil, the engine must be operated at least five to ten minutes without load so the lighter oil is worked into the bearings and onto the cylinder walls.

Also see "Cold Weather Precautions" on page 54 for special instructions.

GEAR LUBRICANT

Tractors shipped from the factory to destinations in the United States of America, Canada, and Mexico are filled with lubricant in the transmission and differential case, final drives, and hydraulic system.

IH Hy-Tran® Fluid is recommended for the hydraulic system. If fluid is used which does not meet requirements of IH B-6 Specifications, International Harvester Company will not be responsible for sub-standard performance of hydraulic components.

LUBRICATION FITTING GREASE

Use IH 251H EP grease or equivalent #2 multi-purpose lithium grease for lubrication fittings on which the hand lubricator is applied.

Note: Keep your supply of lubricating oil and grease absolutely clean and free from dust. Always use clean containers. Keep the lubricator clean and wipe dirt from the fittings before applying the lubricator.

OIL FILTER

The life of your engine depends upon clean oil being circulated to all bearings.

The purpose of the oil filter is to separate and remove the dirt and other foreign substances from the oil to prevent these injurious materials from being circulated to the engine. This filter will keep the circulating oil free of harmful materials. Under normal operating conditions, replace the filter element every 200 hours of operation.

OIL FILTER - Continued

If the element is not serviced and becomes clogged, the element by-pass valve will open and unfiltered oil will be circulated through the engine.

Note: To avoid delays, carry extra filter elements on hand so replacement can be made at the proper time.

Changing the Filter Element

Do not change the element while the engine is running.

1. Remove the oil filter drain pipe cap (Illust. 62A) and allow the oil filter to drain completely.

2. Clean off filter cover "A" (Illust. 62) to prevent dirt from dropping into the filter when the cover is removed.

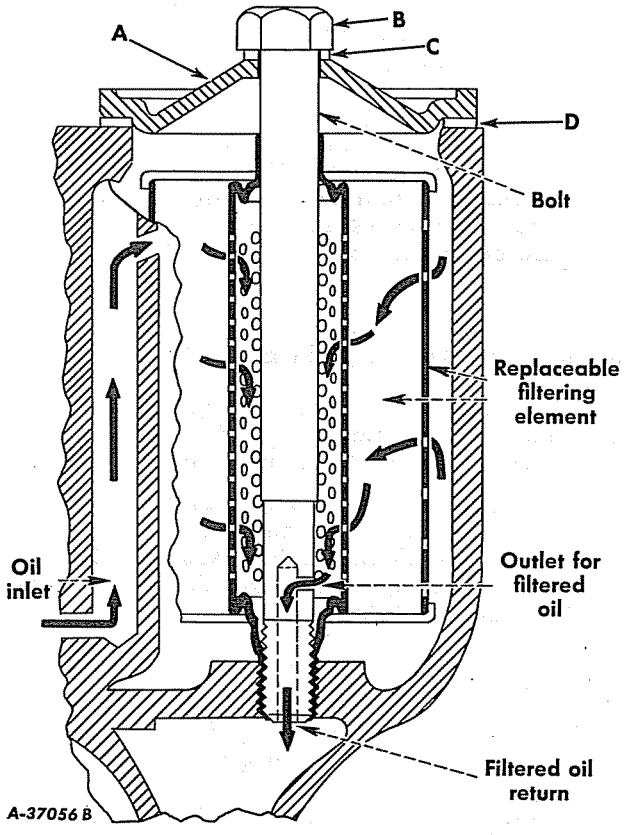
3. Unscrew and remove bolt "B" and gasket "C" (Illust. 62).

4. Lift up and remove filter cover "A" and gasket "D" (Illust. 62).

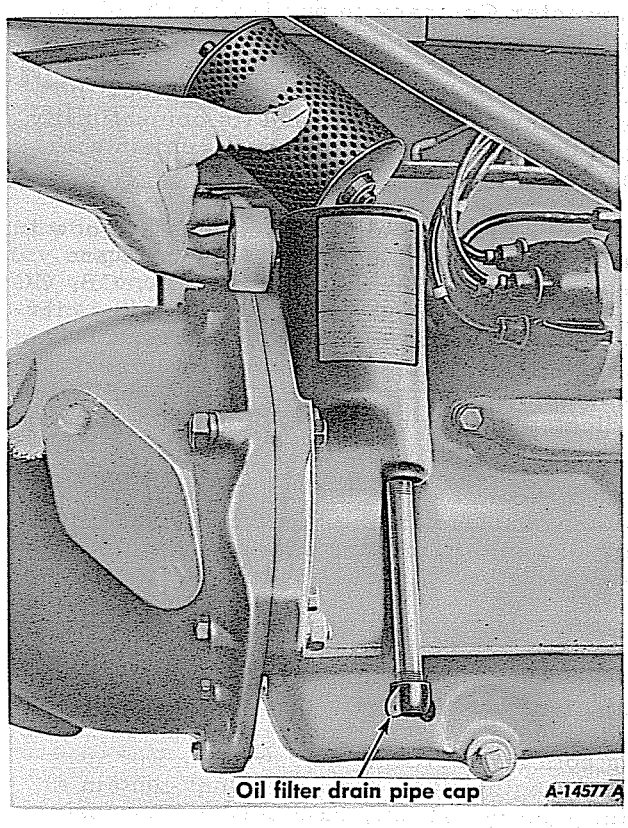
5. Remove the old element.

6. If the oil appears very dirty or sludgy when draining, flush out the filter case with kerosene. Before flushing, however, replace the bolt without the filter cover in order to prevent sludge from being flushed into the crankcase. When completely flushed and drained, replace the drain pipe cap.

7. Inspect the small metering hole at the threaded end of the oil filter retainer bolt, and make sure it is not plugged. A plugged metering hole will impair or stop all oil flow through the oil filter element.



Illust. 62
Diagram of oil flow through the filter.



Illust. 62A
Installing the new oil filter element.

OIL FILTER - Continued

Changing the Filter Element - Continued

8. To install the new filter element, move gasket "C" up to the top of bolt "B" and place cover "A", gasket "D" and the new element on the bolt in their proper order. See Illust. 62. Then install the entire assembly and be sure that filter cover gasket "D" seats properly. Screw the bolt into the filter base and tighten securely.

9. Check the oil level in the crankcase to see that the new oil is up to the proper level (see "Lubrication Guide"). Now start up the engine, check the oil pressure gauge to see whether lubricating oil is circulating through the engine, and inspect the filter for oil leaks.

TOUCH CONTROL SYSTEM

Fluid Level

When the Touch-Control system is filled to the proper level with IH Hy-Tran ® Fluid, it should not require servicing, unless for some reason the system has been disturbed.

If the Touch-Control system should fail to operate in a satisfactory manner, check to see if there are any noticeable leaks in the system, also check the fluid level in the reservoir, or see your International Harvester dealer.

Before removing the filler plug (Illust. 13) for inspection, thoroughly clean the plug and surrounding area of all dirt and grit.

The correct fluid level is to the bottom of the filler opening. If it is necessary to add fluid, use IH Hy-Tran Fluid. It is essential that the fluid be absolutely clean and free from water and all foreign matter when placed in the system. Cloudiness may indicate the presence of moisture.

Never operate the tractor without having sufficient fluid in the reservoir. Insufficient fluid may cause damage to the Touch-Control system.

Note: Failures due to use of improper fluid are not covered by warranty -- FOR MAXIMUM PROTECTION USE IH HY-TRAN FLUID.

Draining and Filling the Reservoir

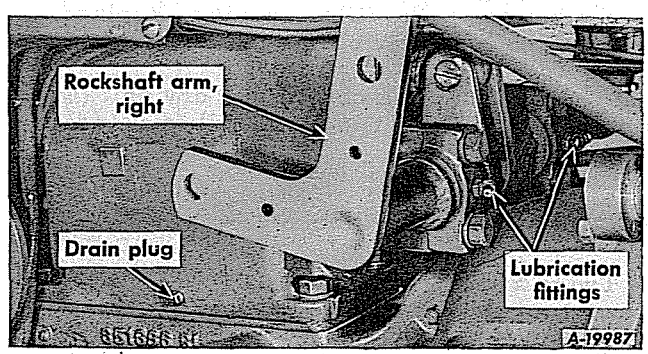
Normally it is not necessary to drain the reservoir at any given time interval. If it becomes necessary to drain the system for any reason, such as disassembly, flushing the system, etc., proceed as follows:

1. Wipe off all dirt and grit from the reservoir and filler plug.

2. Remove the filler plug (Illust. 13) and the drain plug (Illust. 63) and place them in a clean container.

When the fluid has stopped draining, run the engine very briefly to drain the fluid from the pump and connecting pipes.

To clean the strainer, first wipe off all dirt and grit from the cylinder block. If your tractor is equipped with a radiator shutter, disconnect the radiator shutter control rod. Then remove the heat indicator element from the strainer by screwing out the element nut.



Illust. 63
Right side of Touch-Control system.

TOUCH CONTROL SYSTEM - Continued

Draining and Filling the Reservoir - Continued

Now remove the four cap screws which hold the strainer to the cylinder block, and pull out the screen. Clean the strainer thoroughly in clean IH Hy-Tran Fluid.

Then replace the strainer and make sure the gasket is in perfect condition. If the gasket is damaged, replace it with a new one.

Replace the heat indicator element and tighten the element nut sufficiently to prevent leakage of IH Hy-Tran Fluid.

The refill capacity of the Touch-Control system, when drained as instructed above, is 3-1/2 U.S. pints.

Note: If it is necessary to flush the system, use IH Hy-Tran Fluid so the necessary lubrication of the pump and control system is maintained without adulteration. Never use any other oil.

3. After the system has drained completely, replace the drain plug and fill the reservoir to within 1/2-inch of the bottom of the filler opening with IH Hy-Tran Fluid.

4. Start the tractor engine and operate it at a moderate idle speed. With the filler plug removed, move the Touch-Control lever back and forth 10 to 12 times through its full range of travel. This quickly frees the system of trapped air. Then place the control lever in the rearward position (toward the tractor seat) and stop the engine.

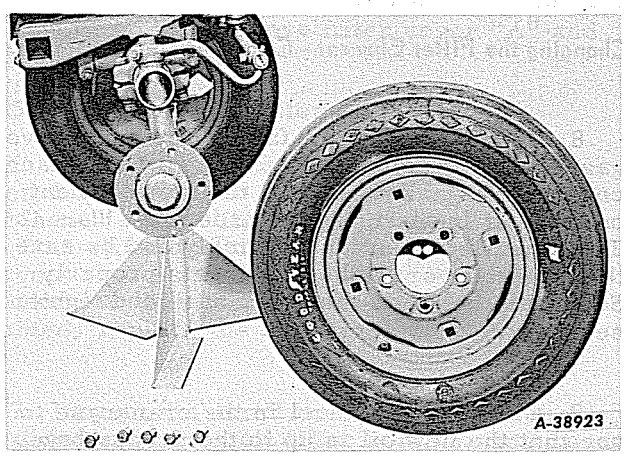
5. Add sufficient clean fluid to the reservoir to bring the fluid level to within 1/2-inch of the bottom of the filler opening. Replace and tighten the filler plug.

The capacity of a completely dry unit (when a new or rebuilt unit is installed) is 4-1/4 U.S. pints.

GREASING THE FRONT WHEELS

Twice a year (spring and fall) remove, clean, and repack the front wheel bearings.

Raise the front end of the tractor until the wheel clears the ground and remove the wheel as shown in Illust. 64. Unscrew hub cap "A" (Illust. 64A), remove the cotter pin, and remove nut "B" and washer "C". Remove bearing "D" and place it in hub cap "A" or a clean container.



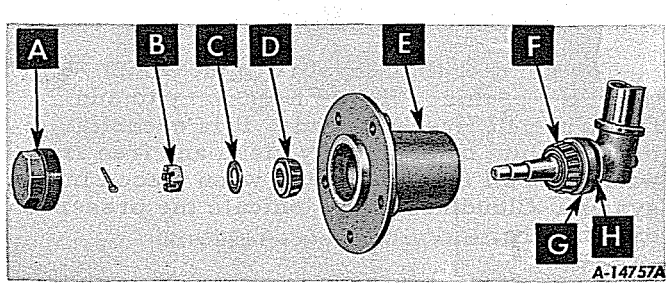
Illust. 64
Front wheel removed from hub.

Clean the inside of hub "E", remove the old grease from the bearings, clean them with kerosene, and repack with IH-251 HEP grease or equivalent #2 multi-purpose lithium grease.

It is advisable to leave bearing "F" on the axle and clean it with a brush and kerosene. Repack the rollers with new grease before reassembling the bearings.

Inspect the oil seal felt washer and gasket and if they are not in satisfactory condition, replace them with new ones. A dirt deflector is also provided on the axle to prevent dirt from entering at the inner bearing.

Reassemble the wheel and tighten nut "B" until the wheel binds slightly, rotating the wheel at the same time. Back the nut off one castellation from the cotter pin hole; replace the cotter pin and hub cap.



Illust. 64A
Front wheel hub and bearing removed for cleaning.

Engine oils meeting standards as shown on page 61 under heading "Engine Oil" must be used in these engines.

Point of Lubrication	Capacity	Anticipated Air Temperature			
		Above +32°F.	+32°F. to +10°F.	+10°F. to -10°F.	Below -10°F.
Engine crankcase.	3 qt.	IH (low ash) SAE-30 See Note A	IH (low ash) SAE-10W	IH (low ash) 2-3/4 qt. SAE-10W w/1/2 pt. kerosene or SAE-5W-20	IH (low ash) 2-1/2 qt. SAE-10W w/1 pt. kerosene
Air cleaner oil cup Donaldson type	1/2 pt.			SAE-10W or SAE-5W-20	
United type.	3/8 pt.				
Magneto (if so equipped) Rotor bearing	xxx	SAE-30		SAE-10W	
Impulse coupling	xxx	Light oil, i.e., cream separator or sewing machine oil		Kerosene	
Battery ignition unit (if so equipped) Distributor and drive housing	xxx	IH 251H EP grease or equivalent #2 multi-purpose lithium grease			
Cam hole felt (in distributor)	xxx	Light engine oil			
Generator.	xxx	SAE-30 engine oil			
Transmission	3-1/2 pt.	IH Hy-Tran® Fluid If fluid is used which does not meet requirements of IH B-6 Specifications, International Harvester Company will not be responsible for substandard performance of hydraulic components. **Note:** Failures due to use of improper fluid or filters are not covered by warranty – **FOR MAXIMUM PROTECTION USE IH HY-TRAN® FLUID AND FILTERS.**			
Rear axle housing	1-3/4 pt.				
Belt pulley housing.	1/3 pt.				
Touch-Control reservoir.	4-1/4 pt.				
Steering gear housing.	3/4 pt.				
Front wheels.	xxx	Use IH 251H EP grease or equivalent #2 multi-purpose lithium grease for fittings on which the hand lubricator is applied.			
Lubrication fittings	xxx				

Note A: Do not substitute SAE 10W-30 or 10W-40.

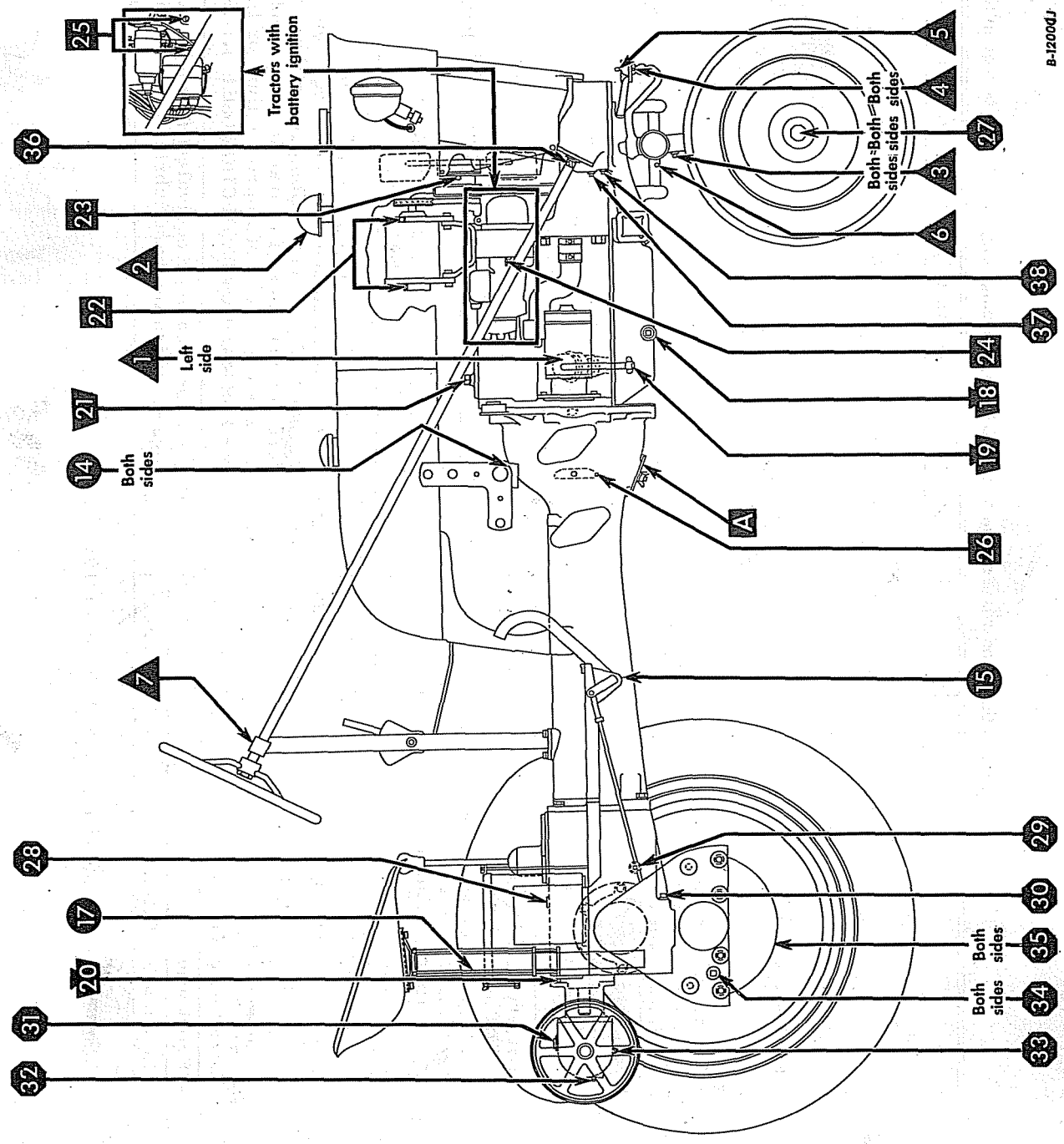
LUBRICATION GUIDE

International Cub Tractor

The symbols around the reference numbers indicate the intervals of lubrication.

▲ —10 hours, ● —50 hours, ⬟ —100 hours, ▼ —200 hours,

■ — 250 hours, ■ — 500 hours, ⯃ — periodic



Illust. 66 - Side view of tractor.

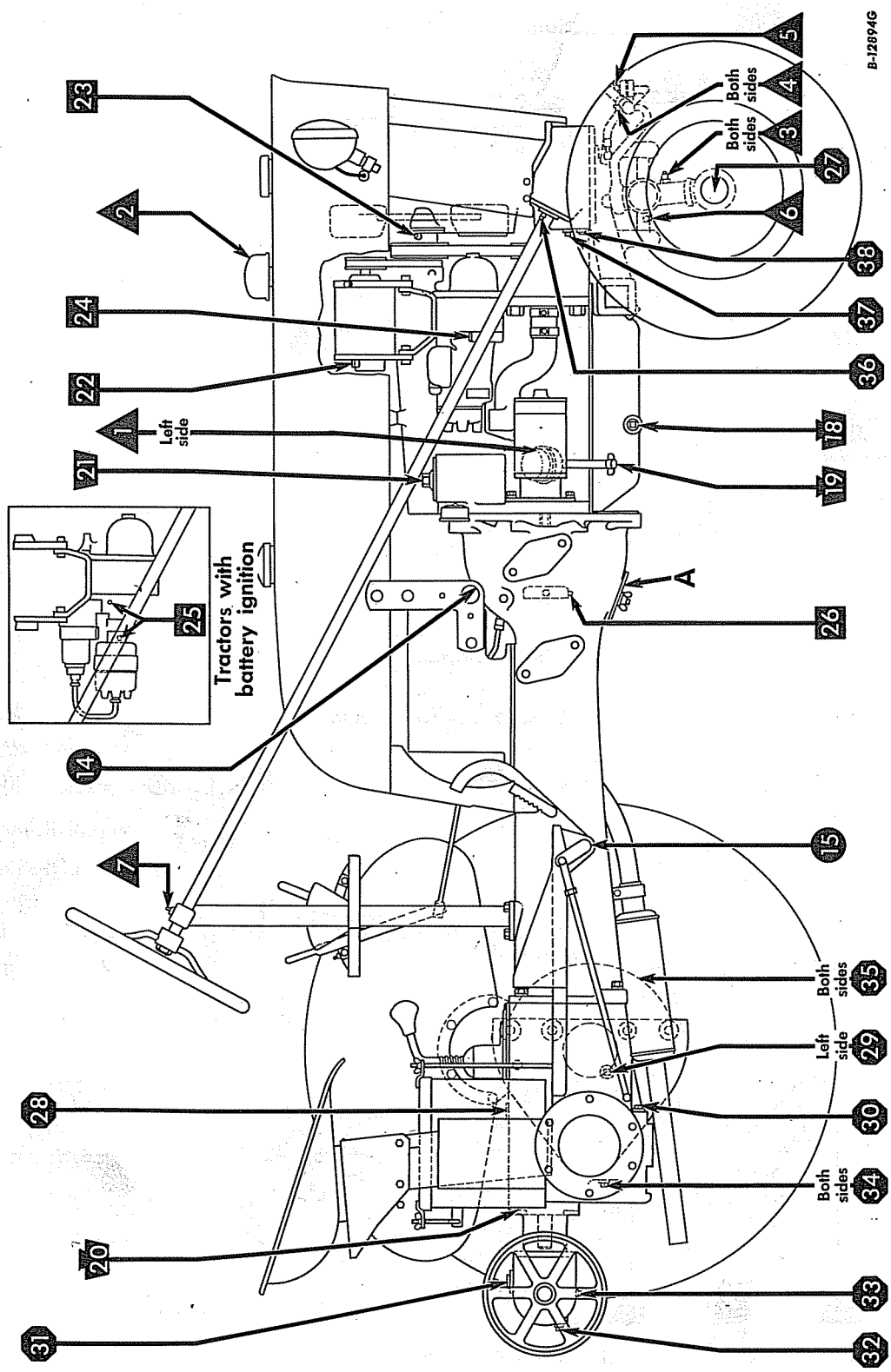
LUBRICATION GUIDE

International Cub Lo-Boy Tractor

The symbols around the reference numbers indicate the intervals of lubrication.

– 10 hours, –50 hours, –100 hours, –200 hours,

– 250 hours, – 500 hours, – Periodic



Illust. 67
Side view of tractor.

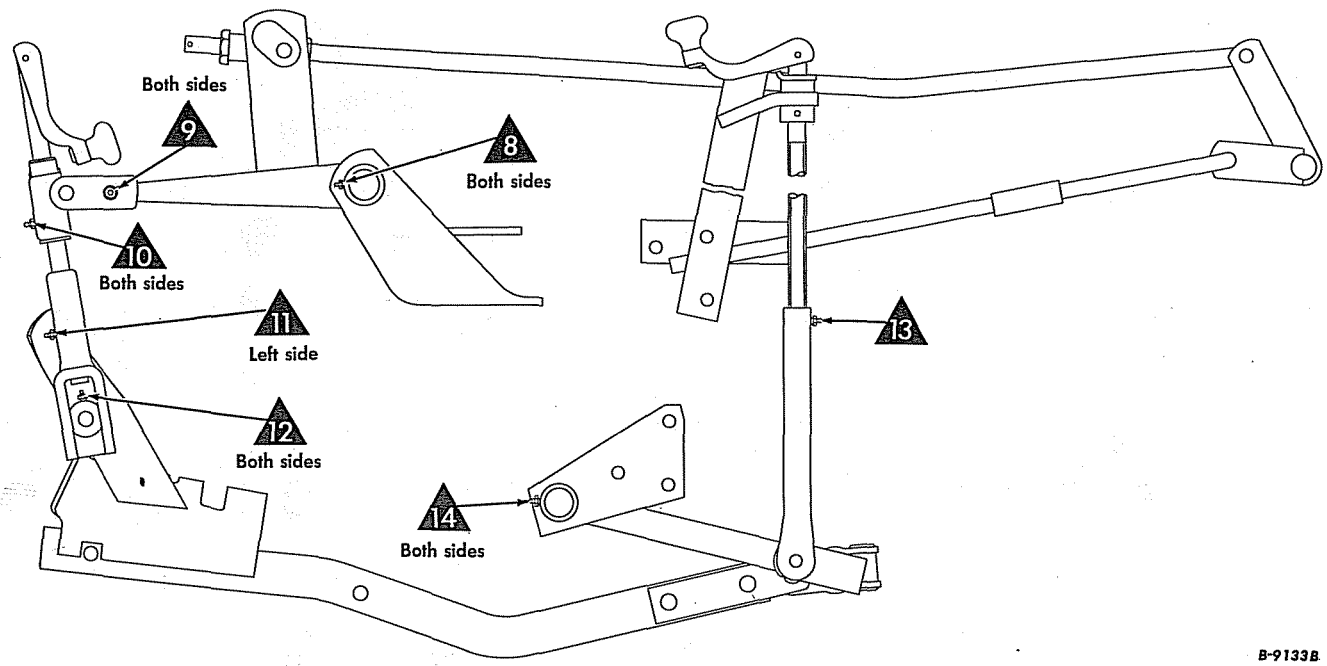
LUBRICATION GUIDE

The symbols around the reference numbers indicate the intervals of lubrication.

—10 hours, —50 hours, —100 hours, —200 hours,

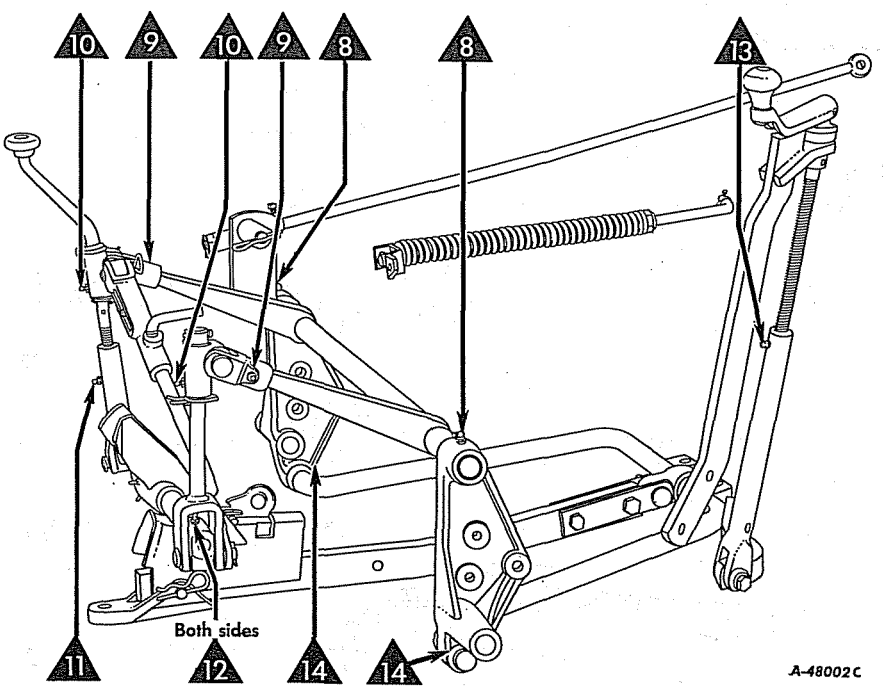
—250 hours, —500 hours, —periodic

International Cub Tractor



Illust. 68 - Fast-Hitch.

International Cub Lo-Boy Tractor



Illust. 68A - Fast-Hitch.

LUBRICATION GUIDE

The symbols shown around the reference numbers in Illusts. 66, 67, 67A, and 68 indicate the intervals of the lubrication. Paragraph numbers correspond to reference numbers in the illustrations.

▲ — Daily or After Every 10 Hours of Operation

1. Crankcase oil level gauge and filler cap.

Check the oil (with the engine stopped) and add sufficient new oil to bring it to the "FULL" mark on the bayonet gauge. Do not check the oil level while the engine is operating or operate the engine if the oil level is below the "LOW" mark on the bayonet gauge. If the oil level is checked after the engine has been stopped for some time, the oil level may show slightly above the "FULL" mark on the gauge. This is a normal condition as the result of oil draining back from the filter.

2. Air Cleaner.

Clean and refill the oil cup to the oil level bead with the same new oil as used in the engine crankcase.

3. Steering knuckle post (2).
4. Tie rod (2).
5. Tie rod ball seat.
6. Front axle pivot shaft.
7. Steering shaft support bracket.

Use IH-251 HEP grease or equivalent #2 multi-purpose lithiun grease and apply two or three strokes of lubricator, or sufficient grease to flush out the old grease and dirt. Lubrication points are the same for both fixed and adjustable front axles.

Fast-Hitch

8. Rockshaft plate bracket (2).
9. Rockshaft arm swivel (2).
10. Lateral link swivel, upper (2).
11. Leveling screw housing (1).
12. Lateral link swivel, lower (2).
13. Depth adjusting screw housing (1).
14. Bail bearing (in bail attaching bracket) (2).

Use IH-251 HEP grease or equivalent #2 multi-purpose lithium grease and apply sufficient lubricant to flush out the old grease and dirt.

● — Weekly or After Every 50 Hours of Operation

15 Touch-Control rockshaft arms.
16 Clutch pedal shaft
17. Seat spring (International Cub)

Use IH-251 HEP grease or equivalent #2 multi-purpose lithium grease and apply two or three strokes of lubricator, or sufficient grease to flush out the old grease and dirt.

Miscellaneous parts

Lubricate the clutch and brake pedal connections with a few drops of engine oil.

LUBRICATION GUIDE

— After Every 100 Hours of Operation

18. Crankcase oil pan.

19. Oil filter drain.

While the oil is warm, remove the crankcase drain plug and oil filter drain pipe cap and drain all of the oil from the crankcase and oil filter. Replace the drain plug and cap. Remove the crankcase filler cap (1). Refill with new oil up to the "FULL" mark on the oil level gauge. Refer to the Lubrication Table.

20. Power take-off shaft.

Use IH-251 HEP grease or equivalent #2 multi-purpose lithium grease and apply one or two strokes of the lubricator.

— After Every 200 Hours of Operation

21. Oil filter element.

Replace the oil filter element every second oil change (200 hours of operation). Remove the crankcase drain plug (18) and allow all the oil to drain out. Remove the oil filter drain (19) and the filter cover (21), and remove the used filter element. Replace the drain plug (18) and install the new filter elements as instructed on page 62.

— Every Six Months or After Every 500 Hours of Operation

22. Generator oil cups (2).

Insert the oil can spout through the holes in the hood above each oil cup. Lift the cap on each oil cup and place 8 to 10 drops of oil in each cup.

Note: Overlubricating will "gum" the commutator, resulting in reduced output and increased wear. Never oil the commutator and do not lubricate the generator while it is in operation.

23. Fan hub.

Turn the fan hub so oil retainer screw (23) is to the right horizontal position. Remove the screw and fill the hub with engine oil to the level of the filler hole opening. Now turn the fan hub so the oil filler hole is on the bottom to allow excess oil to drain off. Replace the oil retainer screw.

24. Magneto.

Fill rotor bearing oil cup (24) once with the same oil used in the engine crankcase.

25. Distributor (battery ignition unit).

Remove the grease plugs and insert lubrication fittings. Apply IH-251 HEP grease or equivalent #2 multi-purpose lithium grease to the distributor fitting until a small quantity comes out of the relief hole opposite the plug. Apply several strokes of the lubricator to the drive housing fitting.

Remove the distributor cap and the distributor rotor, and apply one or two drops of light engine oil to the felt in the hole at the end of the breaker cam.

26. Clutch release bearing.

Use IH-251 HEP grease or equivalent #2 multi-purpose lithium grease. After every 1,000 hours or at least once every year, apply a few strokes of the lubricator to clutch release bearing fitting (26) or just enough grease until it starts to come out of the bleeder hole on top of the bearing retainer. To reach the fitting, remove the clutch housing handhole cover "A".

LUBRICATION GUIDE

Periodic

27. Front wheels.

Twice a year (spring and fall) remove, clean, and repack the front wheel bearings with IH-251 HEP grease or equivalent #2 multi-purpose lithium grease.

Transmission

28. Oil filler plug.
29. Oil level plug.
30. Oil drain plug.

Check the oil level periodically. Keep the lubricant up to level plug (29) on the left side of the transmission case. Change the oil in the transmission case at least once a year, preferably before freezing weather sets in. However, do not drive the tractor more than 1,000 hours without changing the oil. Remove drain plug (30) and allow all oil to drain out. Replace the drain plug and remove filler plug (28) and level plug (29). Refill with approved lubricant up to the level plug opening and replace the plugs. Refer to the Lubrication Table for the approved lubricant and capacity.

Belt Pulley Housing

31. Filler plug.
32. Level plug.
33. Drain plug.

Check the oil level periodically. Use approved lubricant (see the Lubrication Table) and keep the lubricant up to the level plug (32). Drain and refill the housing each time the oil is changed in the transmission case. To change the oil, remove the drain plug (33) and allow all the oil to drain. Then replace the drain plug. Remove filler plug (31) and level plug (32). Fill to the level plug opening and replace the plugs.

Rear Axle Housing

34. Oil filler and level plug (2).
35. Oil pan (2).

Check the oil level periodically. Keep the lubricant up to level plug (34) in each rear axle housing. Remove the drawbar to get at the level plug in the left housing. Change the oil at least once a year. However, do not drive the tractor more than 1,000 hours without changing the oil. To drain, remove rear axle housing pan (35). Clean the pan and replace it. Remove plug (34) and fill up to this level with approved lubricant. Replace the plug. Refer to the Lubrication Table for the approved lubricant and capacity.

Steering Gear Housing

36. Filler plug.
37. Level plug.
38. Drain plug.

Check periodically and add sufficient approved lubricant to the level of plug (37). Remove filler plug (36) and level plug (37) and fill with approved lubricant to the level plug opening. Replace the plugs. Refer to the Lubrication Table for the approved lubricant and capacity.

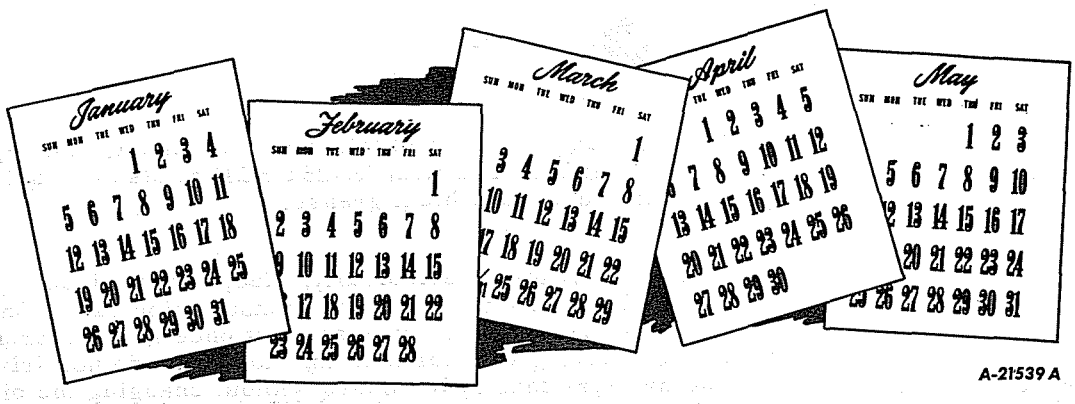
Magneto Distributor Gear

Every year or 2,000 hours repack with IH magneto grease.

Miscellaneous Parts

Occasionally put a few drops of engine oil on the engine control linkage, such as the engine speed control rod, governor connections, etc.

PREVENTIVE MAINTENANCE GUIDE



A-21539 A

To keep your tractor performing efficiently, it is advisable to systematically inspect the following points at intervals as outlined below.

Before Operating the Tractor

Before operating a new tractor for the first time, be sure to follow the instructions given on page 7; also see Lubrication Section on pages 60 to 71.

After the First 10 Hours of Operation

Fan and generator belts	Check tension. See pages 23 and 24.

After Every 10 Hours of Operation

Air cleaner cap	Remove dirt or chaff. See page 25.
Air cleaner oil cup	Clean and refill oil cup. See page 24.
Cooling system	Check level of coolant in radiator (two inches from top of neck).
Lubrication points	See "Lubrication Guide".

After the First 50 Hours of Operation

Cylinder head bolts	Check and tighten to the proper torque. See page 42.*
Engine valves	Check clearance. See pages 42* and 43*.

After Every 50 Hours of Operation

Fan and generator belts	Check tension; replace when necessary. See pages 23 and 24.

*See your International Harvester dealer for this service.

PREVENTIVE MAINTENANCE GUIDE

After Every 50 Hours of Operation

Flexible rubber connection between air cleaner and carburetor or manifold	Inspect for loose fit or leakage. See page 25.
Pneumatic tires	Check pressure. See pages 50 and 51.
Radiator core	Inspect, clean if necessary. See page 23.
Lubrication points	See "Lubrication Guide".

After Every 100 Hours of Operation

Engine crankcase	Drain and change oil.

After Every 150 Hours of Operation

Air cleaner	Disassemble and Clean. See page 25.
Brake pedals	Check for free movement and equal pressure. See pages 51 and 52.
Clutch pedal	Check for free movement. See page 52.
Lubrication points	See "Lubrication Guide".
Engine valves	Check clearance. See pages 42* and 43*.

After Every 200 Hours of Operation

Lubricating oil filter	Replace the filter element. See pages 61 to 63.

After Every 250 Hours of Operation

Crankcase breather	Clean and oil. See page 25.
Fuel strainer and sediment bowl	Take apart and clean. See page 10.
Magneto breaker points and chamber (tractors with magneto)	Check and clean. See page 27.
Magneto drive chamber and impulse coupling (tractors with magneto)	Flush with kerosene. See page 28.
Spark plugs	Remove and clean; check gaps. See pages 26 and 27.
Wheel hub bolts	Check for tightness. See page 44.

After Every 500 Hours of Operation

Engine valves	Check clearance. See pages 42* and 43*.
Fan hub	Add oil to proper level. See page 24.
Fuel line screen (at carburetor)	Clean. See page 11.
Lubrication points	See "Lubrication Guide".

Periodic

Cooling system	Drain, flush, and refill (spring and fall). See pages 21 to 24.
Distributor cap, breaker points and chamber	Clean chamber and check points. See pages 30 and 31.
Front wheels	Clean and repack with new grease twice a year (spring and fall). See page 64.
Storage battery	Check liquid level. See pages 33 and 34.
Lubrication points	See "Lubrication Guide".

* See your International Harvester dealer for this service.

SPECIFICATIONS

CAPACITIES (Approximate-U.S. Measure)

Fuel tank	7-1/2 gal.
Water cooling system	9-3/4 qt.
Crankcase pan	3 qt.
Transmission case	3-1/2 pt.
Rear axle drive housing (each) { International Cub Lo-Boy	1-1/2 pt.
Rear axle drive housing (each) { International Cub	1-3/4 pt.
Steering gear housing	3/4 pt.
Air cleaner oil cup (Donaldson)	1/2 pt.
Air cleaner oil cup (United)	3/8 pt.
Belt pulley housing	1/3 pt.
Touch-Control system	4-1/4 pt.

ENGINE

Cylinders	4
Bore	2-5/8-in.
Stroke	2-3/4-in.
Engine speed (governed)	
Low idle speed	450-500 rpm
High idle (governed speed)	2,000 rpm
Full load (governed speed)	1,800 rpm
Magneto (clockwise rotation)	IH, Type J-4
Spark plug gap	.023-in.
Valve clearance (engine cold)	.015-in.
Carburetor	IH, 3/4-in. updraft
Battery ignition unit (when so equipped) (16° advance distributor)	IH

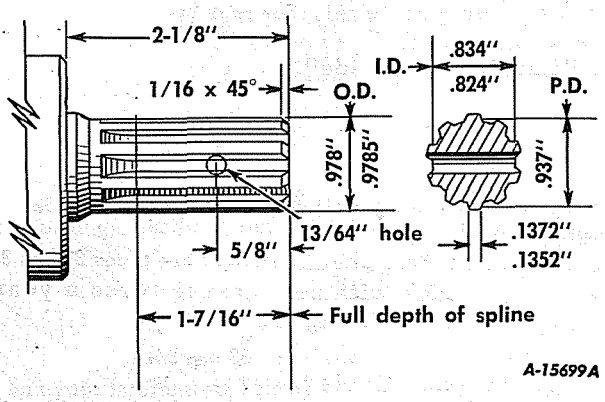
TRANSMISSION (Three Speeds)

(Speeds based on 8—24 pneumatic tire size)

Speed: 1st	2.4 mph
2nd	3.2 mph
3rd	7.3 mph
Reverse	2.7 mph

POWER TAKE-OFF SHAFT SPEED (Counterclockwise Rotation)

Low idle speed	475 rpm
High idle (governed speed)	2,015 rpm
Full load (governed speed)	1,800 rpm



Illust. 74
Power take-off shaft spline dimensions.

The power take-off shaft connection is a 15/16-inch pitch diameter, ten-tooth involute spline with a 30 degree pressure angle, machined for outside diameter fit. The dimensions are shown in Illust. 74.

SPECIFICATIONS

BELT PULLEY

Pulley speed	
Low idle speed	392 rpm
High idle (governed speed)	1,665 rpm
Full load (governed speed)	1,487 rpm
Belt speed (6-in. pulley)	2,336 ft. per min.
(7-5/8-in. pulley) *	2,968 ft. per min.
(9-in. pulley)	3,504 ft. per min.
Pulley diameter	6 in., 7-5/8 in., 9-in.
Pulley face	4-3/4-in.

ELECTRICAL SYSTEM

System voltage	12 volt	6 volt
Generator, Delco-Remy	25 amp.	35 amp.
Voltage regulator, Delco-Remy	2 unit	2 unit
Cranking motor, Delco-Remy	Positive engagement, push button controlled	Bendix drive
Light switch	4 position	4 position
Lamps - all glass, sealed beam units	12-16 volt	6-8 volt
Fuse (cartridge type)	AGC-10 amp.	SFE-20 amp.

CLUTCH

Single-plate, dry-disc, spring-loaded	6-1/2 in.

FOOT BRAKES

External contracting on drums.

WHEELS AND TREAD	International Cub	International Cub Lo-Boy
Front wheels, pneumatic tire size	†4.00-12	†4.00-12
Rear wheels, pneumatic tire size	†8.3-24	†8.3-24
Wheelbase	69-1/4 in.	61-7/8-in.
Tread, front (standard-fixed axle with reversible wheels)	40-5/8 and 46-3/8 in.	43 and 49-in.
Tread, front (adjustable front axle, 4-in. intervals)	40-5/8 and 56-5/8 in.	39 to 55-in.
Tread, rear (adjustable-reversible wheels and rims, 4-in. intervals)	40 to 56 in.	40 to 56-in.
GENERAL		
Length, over-all	99-3/8 in.	92-in.
Width, over-all-minimum treads	48-1/4 in.	48-1/4-in.
Width, over-all-maximum treads	64-1/4 in.	64-1/4-in.
Height, over-all (to top of steering wheel)	62-3/4 in.	56-1/4-in.
Ground clearance for crops: Under front axle	20-3/8 in.	14-in.
Under rear axle	20-3/4 in.	14-in.
Quick-attachable drawbar (adjustable):		
Normal height	14-3/8 in.	12-3/4-in.
High and low positions	12-3/8 and 16 in.	11 and 14-1/2-in.
Lateral adjustment	11-3/8 in. on each side of center hole	11-3/8-in. on each side of center hole
Fast-Hitch drawbar: Height above ground	7 to 22 in.	4 to 24-in.
Lateral movement	9-1/2-in.	9-1/2-in.
Minimum turning radius with minimum treads		
With brake applied	8-1/4 ft.	8-1/4 ft.

† Other pneumatic tire sizes are available.

* Regularly supplied with belt pulley.

Specifications are subject to change without notice

EXTRA EQUIPMENT AND ACCESSORIES

The tractor is used for so many different types of work and is called on to operate under so many different conditions that a considerable variety of equipment is necessary to adapt it to the varied requirements of the user.

When you purchased your tractor, you probably had it completely equipped for your particular needs at that time. However, later you may wish to obtain some of the equipment or accessories listed below. These items can be purchased from and installed by your International Harvester dealer.

Type of Equipment	Type of Equipment
Belt Pulley and/or Power Take-Off	Pull Bar Extension (Tractors with Fast-Hitch)
De Luxe Upholstered Seat	Rear Wheel Weights
Detachable Seat Pads	
Fast-Hitch	Tachometer
Front Axle, Adjustable	Tire Pump for Pneumatic Tires
Front Wheel Weights	Tire Pump Kit for Pneumatic Tires
	Touch-Control
High Altitude Cylinder Head	
Horn	Valve Rotators

INDEX

Description	Page No.	Description	Page No.
Adding water to the cooling system (When equipped with pressure-type radiator cap)	21, 22	Care of the engine clutch	52
Adjustable wide tread front axle	44, 45	Care of tires	50
Adjusting the drawbar	18	Changing from belt pulley to power take-off	20
Adjusting the engine clutch	52, 53	Changing from power take-off to belt pulley	20
Adjusting the front wheel tread widths	44	Charge indicator	6
Adjusting the seat (International Cub)	11	Choke rod	5
Adjusting the seat (International Cub Lo-Boy)	11, 12	Cleaning the cooling system	22
Adjusting the tread widths (Rear Wheels)	46	Cleaning the fuel strainer and sediment bowl	10
After the engine starts	10	Clutch	52, 53
Air cleaner oil cup	8	Clutch pedal	5
Air cleaning system	24, 25	Cold weather precautions	55
Air in the system	14	Combination rear light and tail-light	33
Air intake cap and screen	25	Contents	Cover No. 2
Before operating the tractor	7	Cooling system	21 to 24, 55
Belt pulley and power take-off	19, 20	Coupling the equipment (Fast-Hitch)	17
Belt pulley and power take-off shifter rod	6	Crankcase breather	25
Brakes	51, 52	Crankcase breather and oil filler cap	60, 61
Brake adjustment	51, 52	Crankshaft bearings, pistons, and rings	42
Brake pedals	4, 5	Cylinder head gasket	42
Carburetor	11	Distributor and coil unit	30, 31
Carburetor choke lever	5	Driving the tractor	11, 12

INDEX

Description	Page No.
Electrical system	25 to 41
Engine cooling system	7
Engine oil	61
Engine speed control lever	5
Extra equipment and accessories	76
Fan belt tension	23
Fan hub lubrication	24
Fast-Hitch	14 to 17
Fast-Hitch load limitations	17
Filling the cooling system	21
Filling the fuel tank	8
Front wheels	44, 45
Front wheel weights (one piece)	48
Front wheel weights (two piece)	48, 49
Fuel system	7, 9, 10, 11, 55
Fuse	33
Gasoline engine	9, 10
Gear lubricant	61
Gearshift lever	5
General precautions (Air Cleaning System)	25
Generator and regulator	32
Generator belt	24
Generator belt tension	32
Governor	5
Greasing the front wheels	64
Headlights	32
Hitch adjustments	17
Hitching trailing equipment to the tractor	18
Ignition coil	32
Ignition switch (12-volt system)	5
Ignition switch button (6-volt system)	6
Inflation, tire	50
Instruments and controls	4 to 6
Introduction	2, 3
Lighting switch	6
Locking the brakes	12
Lubrication	7, 55, 60 to 64
Lubrication fitting grease	61
Lubrication guide	66 to 71
Lubrication table	65
Magneto	27 to 30
Magneto impulse coupling (Tractors with magneto)	55
Minor engine service operations	42, 43
Mounting tires on the rim	51
Oil cup service	24
Oil filter	61 to 63
Oil pressure gauge	6
Oil pump	61
Operating pressure for low-pressure tractor tires	50, 51
Operating the belt pulley or power take-off with the tractor standing still	19
Operating the power take-off with tractor in motion	20
Overloading	51
Pneumatic tires	7, 50, 51
Polarizing the generator	32
Power timing light	32
Preparing for each day's work	8
Push button starting switch	5
Preventive maintenance guide	72, 73
Pull bar extension (Fast-Hitch)	17
Radiator core	23
Rear wheels	46, 47
Rear wheel weights	49
Removing from storage	54
Removing the drawbar	18
Rust prevention	22, 23
Safety instructions	1
Shipping tractors equipped with pneumatic tires	50
Spark plugs and cables	26, 27
Specifications	74, 75
Starting switch control rod	6
Starting the engine (6-volt system)	9, 10
Starting the engine (12-volt system)	9
Starting the tractor	12
Steering the tractor	12
Stopping the engine	10
Stopping the tractor	12
Storage battery	33, 34
Storing the tractor	53, 54
Tachometer drive unit	43
Taillight	33
Tire chains	51
To aid starting	61
Touch-Control system	13, 14, 63, 64
Towing the tractor	12
Traction and weights	51
Tractor break-in procedure	7
Trouble shooting	56 to 60
Using the spark plug tire pump	50
Valve clearance adjustment	42, 43
Warning light	33
Washing the cleaner	25
Weights	48, 49
Wheel weights	51

MOTOR # 88X
L3
251341 R-8

TRACTOR # 244607

Accidents can be prevented with your help

No accident-prevention program can be successful without the wholehearted co-operation of the person who is directly responsible for the operation of equipment.

To read accident reports from all over the country is to be convinced that a large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it be on the highway, in the harvest field or in the industrial plant, can be safer than the man who is at the controls. If accidents are to be prevented—and they can be prevented—it will be done by the operators who accept a full measure of their responsibility.

It is true that the designer, the manufacturer, the safety engineer can help; and they will help, but their combined efforts can be wiped out by a single careless act of the operator.

It is said that ***"the best kind of a safety device is a careful operator."*** We ask you to be that kind of an operator.

PLUGS
Champion
D 15Y

INTERNATIONAL HARVESTER COMPANY
401 NORTH MICHIGAN AVE. / CHICAGO, ILLINOIS 60611 / U.S.A.

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